Conext™ CL Three Phase Grid Tie Inverters
Conext CL 18000NA
Conext CL 25000NA

Installation and Operation Manual

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Schneider Electric

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Contact Information

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About This Manual

Purpose

The purpose of this Installation and Operational Manual is to provide explanations and procedures for installation, operation, maintenance, and troubleshooting information for the following inverter models:

Part Number	Description
PVSCL18NA100	Conext CL 18000NA Outdoor Base
PVSCL18NA200	Conext CL 18000NA Outdoor Essential
PVSCL18NA201	Conext CL 18000NA Outdoor Essential plus
PVSCL18NA300	Conext CL 18000NA Outdoor Optimum
PVSCL18NA301	Conext CL 18000NA Outdoor Optimum plus
PVSCL25NA100	Conext CL 25000NA Outdoor Base
PVSCL25NA200	Conext CL 25000NA Outdoor Essential
PVSCL25NA201	Conext CL 25000NA Outdoor Essential plus
PVSCL25NA300	Conext CL 25000NA Outdoor Optimum
PVSCL25NA301	Conext CL 25000NA Outdoor Optimum plus

Scope

The Manual provides safety information and guidelines, detailed planning and setup information, procedures for installing the Conext CL inverter, as well as information about operating and troubleshooting the inverter. It does not provide details about particular brands of photovoltaic panels. For more information, consult individual PV manufacturers.

Audience

The information in this document is intended for a qualified personnel, who has training, knowledge, and experience in:

- Installing electrical equipment and PV power systems up to 1000 VDC.
- Applying all local installation codes.
- Analyzing and eliminating the hazards involved in performing electrical work.
- Selecting and using Personal Protective Equipment (PPE).

Installation, commissioning, troubleshooting, and maintenance of the inverter must be done only by qualified personnel.

This manual is for use by qualified personnel only

Organization

This manual is organized into the following chapters and appendices.

Chapter 1, “Introduction” provides information about Conext CL18000NA and Conext CL 25000NA three phase grid tie inverters.

Chapter 2, “Installation and Configuration” provides information and procedures for installing and configuring the inverter and the wiring box.

Chapter 3, “Operation” contains information on the basic operation of the inverter and the wiring box.

Chapter 4, “Troubleshooting” describes the event and service messages that might be displayed on the LCD of the inverter and the recommended solutions.

Chapter 5, “Maintenance” contains information and procedures for performing preventive maintenance on the inverter and the wiring box.

Appendix A provides the environmental, electrical, and other specifications for the inverters.

Appendix B describes the information that can be displayed on the LCD of the inverter.

“Information About Your System”can be used to record information about the inverter package.

Save this manual for easy access during the installation, maintenance and trouble shooting of the inverter.

Related Information

You can find more information about Schneider Electric Solar, as well as its products and services, at solar.schneider-electric.com.

Conventions Used

The following conventions are used in this guide.

⚠⚠ DANGER

DANGER indicates an imminently hazardous situation, which, if not avoided, will result in death or serious injury.

⚠ WARNING

WARNING indicates a potentially hazardous situation, which, if not avoided, can result in death or serious injury.

⚠ CAUTION
CAUTION indicates a potentially hazardous situation, which, if not avoided, can result in moderate or minor injury.

NOTICE
NOTICE indicates a potentially hazardous situation, which, if not avoided, can result in equipment damage.

Product Names

This manual includes information for two products: Conext CL 18000NA and Conext CL 25000NA photovoltaic three phase transformerless grid tie inverters each with five models of the wiring box. The following table lists the naming conventions used to differentiate information that only applies to one of the two inverters. For information common to all products, “inverter” is used.

Product Name	Usage
Conext CL 18000NA	The information provided is specific to the 18 kVA Conext CL photovoltaic grid tie inverter
Conext CL 25000NA	The information provided is specific to the 25 kVA Conext CL photovoltaic grid tie inverter

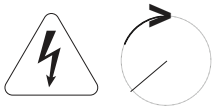
Abbreviations and Acronyms

Term	Definition/description
AC	Alternating Current
ADC	Analog to Digital Converter
AFD	Arc Fault Detector
AFDI	Arc Fault Detector and Interrupter
Cap	Capacitive
CSA	Canadian Standards Association
DC	Direct Current
DSP	Digital Signal Processing
GND	Ground
Ind	Inductive
IP	Ingress protection
I_{SC}	Short circuit current rating of a PV panel under STC. (See STC, below)

Term	Definition/description
$I_{SC\ max}$	Absolute maximum short circuit current permitted from the PV array
L1	AC Line 1
L2	AC Line 2
L3	AC Line 3
LCD	Liquid Crystal Display
LED	Light Emitting Diode (indicator light)
LVRT	Low Voltage Ride Through
MPP	Maximum Power Point
MPPT	Maximum Power Point Tracking
N	Neutral
NA	North America
NEC	National Electrical Code
NC	Normally Closed
NO	Normally Open
OD	Outer Diameter
OOCP	Output Over Current Protection
P	Active Power
PE	Protective Earth (ground)
P_n	Real power nominal
P_m	Percentage of Rated Power
Po	Output power
PPE	Personal Protective Equipment
PV	Photovoltaic
Q	Reactive power
RCD	Residual Current Detection
RCMU	Residual Current Monitoring Unit
RPO	Remote Power Off
SELV	Safety Extra Low Voltage
Sn	Apparent power nominal

Term	Definition/description
STC	Standard Test Conditions specific to photovoltaic panels (1000 W/m^2, light spectrum AM 1.5 and 25 °C [77 °F]); panel nameplate ratings are based on STC and may be exceeded under some conditions.
THD	Total Harmonic Distortion
UL	Underwriters Laboratories
UV	Ultraviolet
V	Voltage
VAC	Volts AC
VDC	Volts DC
VMPP	Voltage at Maximum Power Point
VOC	Open circuit voltage rating of a PV panel under STC
VOC max	Absolute maximum open circuit voltage permitted from a PV array

Symbols on the Inverter

Symbols	Explanation
	Hazard of fire, arc flash, or electric shock from multiple sources
	The inverter is energized from two sources. Before opening the cover, physically isolate all the sources of power, and then wait atleast five minutes for internal capacitors to discharge.
	Refer to the Conext CL Installation and Operation Manual.
	Protective earthing connection
	The product works with high voltages. All work on the Conext CL Inverter must follow the described documentation and must comply with all the prevailing codes and regulations associated with high voltages.
	Caution, risk of danger

Product Recycling

Do not dispose of this product with general household waste!

Electric appliances marked with the symbol shown, must be professionally treated to recover, reuse, and recycle materials in order to reduce negative environmental impact. When the product is no longer usable, the consumer is legally obligated to ensure that it is collected separately under the local electronics recycling and treatment scheme.

Important Safety Instructions

READ AND SAVE THESE INSTRUCTIONS – DO NOT DISCARD

This manual contains important safety instructions that must be followed during the installation and maintenance of the Conext CL18000NA and Conext CL 25000NA three phase transformerless grid tie inverters. Read and keep this manual for future reference.

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service or maintain it. The following special messages may appear throughout this bulletin or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

The addition of this symbol either to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.

DANGER
DANGER indicates an imminently hazardous situation, which, if not avoided, will result in death or serious injury.

WARNING
WARNING indicates a potentially hazardous situation, which, if not avoided, can result in death or serious injury.

CAUTION
CAUTION indicates a potentially hazardous situation, which, if not avoided, can result in moderate or minor injury.

NOTICE
NOTICE is used to address practices not related to physical injury. The safety alert symbol shall not be used with this signal word.

Safety Information

- Before using the inverter, read all instructions and cautionary markings on the unit, and all appropriate sections of this manual.
- Use of accessories not recommended or sold by the manufacturer may result in a risk of fire, electric shock, or injury to persons.
- The inverter is designed to be permanently connected to your AC and DC electrical systems. The manufacturer recommends that all wiring be done by a certified technician or electrician to ensure adherence to the local and national electrical codes applicable in your jurisdiction.
- Do not operate the inverter if it is damaged in any way.
- This inverter (excluding the wiring box) does not have any user-serviceable parts. Do not disassemble the inverter except where noted for connecting wiring and cabling. See your warranty for instructions on obtaining service. Attempting to service the unit yourself may result in a risk of electrical shock or fire. Internal capacitors remain charged after all power is disconnected.
- To reduce the risk of electrical shock, isolate both AC and DC power from the inverter before attempting any maintenance or cleaning or working on any components connected to the inverter. Putting the unit in Standby mode will not reduce this risk.
- The inverter must be provided with an equipment-grounding conductor connected to the AC input ground.
- Remove personal metal items such as rings, bracelets, necklaces, and watches when working with electrical equipment.
- The Conext CL inverter is energized from two sources: PV array while exposed to sunlight and AC grid. Before opening the cover for servicing, check the system diagram to identify all the sources, de-energize, lock-out and tag-out*, and wait for at least five minutes for the internal capacitors to discharge completely.

  *It may be noted that, lock-out and tag-out instructions does not hold good during firmware upgrade as either AC grid supply or DC power supply is required to upgrade the firmware.
- The Conext CL inverter employs field adjustable voltage and frequency set points and time delays that are factory set in compliance with local utility and safety requirements. This can be changed only by qualified personnel with approval by both the local utility and equipment owner.
- Before servicing, test the inverter using a meter, rated at least 1000 VDC and 600 VAC to make sure all the circuits are de-energized.

- Do not use the Conext CL inverter in connection with life support systems, medical equipment, or where human life or medical property could be at stake.
- Use the inverter only in grid-interconnected PV systems. The inverter does not support off-grid, stand-alone, power backup function.
- A person with pacemaker must avoid coming in the close proximity of the inverter.
- In outdoor installations, do not open the wiring box cover when humidity is higher(>95%), during snow fall, rain fall or during any other adverse environmental conditions.
- Do not install the inverter in a zero-clearance or in unventilated compartments.
- The Conext CL must be used only in countries specified by Schneider Electric (contact Schneider Electric for the latest list of approved countries).
- Ensure to operate all the components within the permitted range.
- Do not attempt to modify/replace/remove the components and protective barriers that are not supplied with the package, unless otherwise specified in this manual.
- Do not use grounded PV modules with Conext CL inverters.

The term “qualified personnel” is defined on page iii of this manual. Personnel must be equipped with appropriate PPE and follow standard electrical work practices. The inverter is energized from the AC grid and up to eight PV circuits on the DC side. Before servicing the inverter or accessing the wiring box, isolate all the sources and wait at least five minutes to allow internal circuits to discharge. Ensure that all the components inside the wiring box have attained safe temperature before accessing the internal components.

Operating the RPO (Remote Power Off) circuit or switching off the DC disconnect does not remove the DC and AC power from the inverter. The internal parts and the external wiring remain live unless the PV and AC circuits are physically isolated.

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, AND ARC FLASH FROM MULTIPLE SOURCES

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E or CSA Z462.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Never operate energized with covers removed.
- The Conext Inverter is energized from two sources. Before opening cover, disconnect all sources of power, and then wait at least five minutes for internal capacitors to discharge.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace all devices, doors and covers, before turning on power to this equipment.

Failure to follow these instructions will result in death or serious injury.

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, AND ARC FLASH

The inverter is not user serviceable. To be installed and serviced by qualified personnel, equipped with appropriate personal protective equipment and following safe electrical work practices.

Failure to follow these instructions will result in death or serious injury.

⚠ WARNING

HAZARD OF ELECTRIC SHOCK AND EXPLOSION

- Disconnect all the power sources before making any connection.
- Connect the communication ports to Safety Extra Low Voltage (SELV) circuits only.

Failure to follow these instructions can result in death or serious injury.

FCC Information to the User

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may

cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

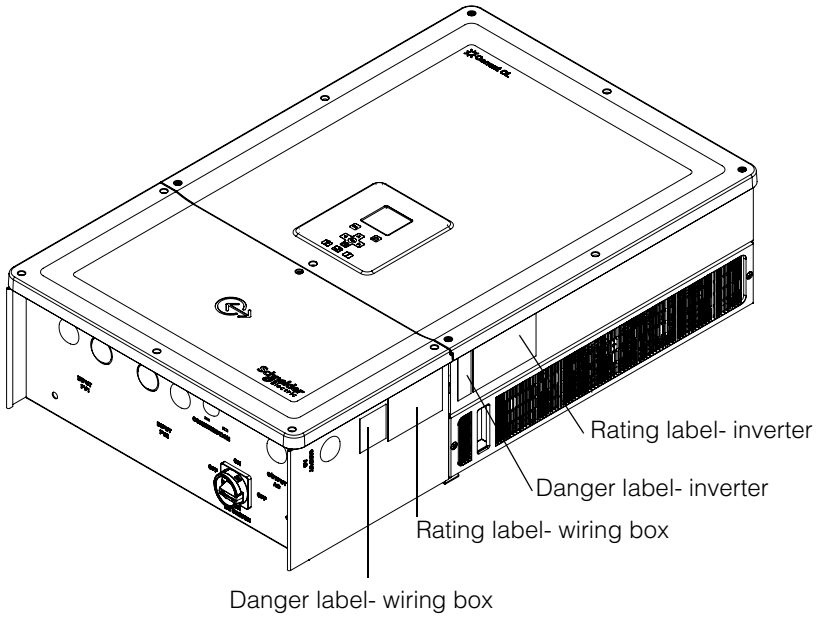
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

All electrical installations must be done in accordance with the local and National Electrical Code, ANSI/NPFA 70 or the Canadian Electrical Code CSA C22.1. All installations must conform with the laws, regulations, codes and standards applicable in the jurisdiction of installation. Wiring of the product should be done by a qualified personnel only.

The product contains no user-serviceable parts. For all repair and maintenance, contact Schneider Electric.

Safety and Rating labels

The safety labels are on the right side of the inverter and wiring box as shown in the figure below.



Safety equipment

Qualified service personnel must be equipped with appropriate Personal Protective Equipment (PPE) that include, but are not necessarily limited to the following:

- Safety gloves
- Safety glasses
- Composite-toed safety boots
- Safety hard hats
- Double-insulated tools
- Appropriate meter to verify that the circuits are de-energized (1000 volts DC or 600 volts AC rated, minimum)

Check the local safety regulations for other requirements.

Contents

Important Safety Instructions

READ AND SAVE THESE INSTRUCTIONS - DO NOT DISCARD ---- ix
Safety Information ---- x
FCC Information to the User ---- xii
Safety and Rating labels ---- xiii
Safety equipment ---- xiii

Introduction

Description of the Conext Grid Tie Solar Inverter ---- 1–2
Key Features ---- 1–3
Block Diagram ---- 1–4
Physical Features ---- 1–5
Air Ventilation ---- 1–6
Bottom view of Wiring box ---- 1–7

Installation and Configuration

Transportation ---- 2–2
Lifting ---- 2–2
Package Inspection ---- 2–2
Wiring box ---- 2–2
Scope of delivery ---- 2–2
Wiring box Nameplate ---- 2–3
Inverter ---- 2–5
Scope of delivery ---- 2–5
Nameplate ---- 2–5
Planning for Installation ---- 2–6
Installation Overview ---- 2–6
Environmental Requirements ---- 2–8
Improper Usage ---- 2–9
Correct Mounting Position ---- 2–10
Dimensions ---- 2–12
Wiring Box Configurations ---- 2–13
Tools Required ---- 2–17
Torque Table ---- 2–17
Mounting ---- 2–18
Fastening the Mounting Plate to the Wall ---- 2–18
Dimensions of the Mounting Brackets ---- 2–19
Pole Mounting ---- 2–22
Mounting the Wiring box and Inverter ---- 2–25

Planning and Wiring - - -

Troubleshooting

Messages ---- 4–2

Maintenance

Periodic Maintenance ---- 5–2
Factors Affecting the Inverter Performance ---- 5–3
PV Array Factors ---- 5–3
Other Factors ---- 5–3
Performing General Maintenance ---- 5–4
Semi-Annual Maintenance ---- 5–4
Cleaning the Louver Cover ---- 5–7
Cleaning the Fans ---- 5–7
SPD Replacement ---- 5–9
Fuse Replacement ---- 5–9
AFD Fault ---- 5–10
De-commissioning ---- 5–10
Firmware Upgrade process ---- 5–11

Specifications

System Specifications ---- A–2
RCMU ---- A–5
Efficiency Curves ---- A–5
Derating Curves ---- A–6

Descriptions of LCD Information

Description of Information Displayed on the LCD ---- B–2

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Figures

Figure 1-1 Typical installation (Optimum plus Configuration) - 1–2
Figure 1-2 Block diagram of the Conext CL 18000NA and 25000NA models - - - - - - - - - - - - - - - - - 1–4
Figure 1-3 Location of physical features of the inverter and the wiring box- right side view - - - - - - 1–5
Figure 1-4 Location of physical features of the inverter and the wiring box- left side view - - - - - - - 1–5
Figure 1-5 Cooling arrangement of the inverter - 1–6
Figure 1-6 Bottom view of the wiring box - 1–7
Figure 2-1 Packing list- Wiring box - 2–3
Figure 2-2 Nameplate label- Wiring box- 2–4
Figure 2-3 Packing list- Inverter - 2–5
Figure 2-4 Inverter nameplate label- 2–6
Figure 2-5 Correct mounting position - 2–11
Figure 2-6 Incorrect mounting positions - 2–11
Figure 2-7 Proper installation distances of the inverter - 2–12
Figure 2-8 Views and dimensions of the inverter and the wiring box - 2–12
Figure 2-9 Wiring box- Base (PVSCL1825NA100) - 2–14
Figure 2-10 Wiring box- Essential (PVSCL1825NA200) - 2–14
Figure 2-11 Wiring box- Essential plus(PVSCL1825NA201) - 2–15
Figure 2-12 Wiring box- Optimum (PVSCL1825NA300) - 2–16
Figure 2-13 Wiring box- Optimum plus (PVSCL1825NA301) - 2–16
Figure 2-14 Mounting bracket dimensions- Wiring box and Inverter - 2–19
Figure 2-15 Fastening the wiring box mounting plate to the wall - 2–20
Figure 2-16 Fastening the inverter mounting plate to the wall - 2–21
Figure 2-17 Inverter rear view with mounting bracket - 2–22
Figure 2-18 Front view of the pole mounting installation - 2–23
Figure 2-19 Rear view of the pole mounting installation - 2–23
Figure 2-20 Pole mounting- rear view with the inverter installed - 2–24
Figure 2-21 Inverter and Wiring box- Exploded view- 2–24
Figure 2-22 Mounting the wiring box on the bracket - 2–26
Figure 2-23 Fastening the wiring box to the mounting bracket - 2–27
Figure 2-24 Opening the front cover of the wiring box - 2–27
Figure 2-25 Removing the connector cover - 2–28
Figure 2-26 Anchoring the connector cover - 2–28
Figure 2-27 Inverter assembly- side view - 2–29
Figure 2-28 Inverter assembly- front view - 2–29
Figure 2-29 Locking the inverter to the wiring box - 2–30
Figure 2-30 Locking Inverter and Wiring box power connector - 2–30
Figure 2-31 Closing the wiring box - 2–31
Figure 2-32 Affixing the silicone layer - 2–31

Figure 2-33 PV Wiring diagram of the Conext CL 18000 NA and 25000 NA models - - - - - - - - - - - -2–35
Figure 2-34 MPPT Shorting Connector and Jumper arrangement -2–36
Figure 2-35 Wire installation -2–39
Figure 2-36 Wire installation-2 -2–39
Figure 2-37 AC connection details -2–40
Figure 2-38 AC wiring -2–40
Figure 2-39 Connecting the earthing conductor -2–43
Figure 2-40 Communication interface- -2–43
Figure 2-41 Modbus (RS485) connectors -2–45
Figure 2-42 Ethernet Connection -2–46
Figure 2-43 Daisy chain configuration -2–46
Figure 2-44 RS485 wiring with multiple inverters -2–47
Figure 2-45 RPO and Relay Contact terminal details -2–47
Figure 2-46 Dry Contact Relay connection -2–48
Figure 2-47 RPO connection with shorting link -2–49
Figure 2-48 RPO connection with single inverter -2–49
Figure 2-49 RPO connection for multiple inverter- -2–49
Figure 2-50 AFCI menu structure -2–50
Figure 2-51 Arc Fault Detection and Surge Protection device wiring - 2-51
Figure 2-52 Web interface connection diagram- -2–52
Figure 2-53 Web interface dashboard screen -2–52
Figure 3-1 LCD Control Panel -3–3
Figure 3-2 Progress bar -3–5
Figure 3-3 First time power up screen -3–6
Figure 3-4 General Settings screen1 -3–7
Figure 3-5 General Settings screen 2 -3–7
Figure 3-6 Quick view -3–8
Figure 3-7 Menu structure -1 -3–9
Figure 3-8 Menu structure- 2 -3–10
Figure 3-9 Menu structure -3 -3–11
Figure 3-10 Menu structure -4 -3–12
Figure 3-11 Menu structure -5 -3–13
Figure 3-12 Menu structure -6 -3–13
Figure 3-13 Home page -3–14
Figure 3-14 Inverter Info -3–14
Figure 5-1 Loosening the louver cover- right side -5–5
Figure 5-2 Loosening the louver cover- left side -5–5
Figure 5-3 Removing the louver cover- right side- -5–6
Figure 5-4 Removing the louver cover- left side- -5–6
Figure 5-5 Fan location -5–7
Figure 5-6 Removing the fan -5–7
Figure 5-7 Removing the fan connector -5–8
Figure 5-8 Inserting the fan connector -5–8
Figure 5-9 Diagnostics menu- -5–9

Figure 5-10 Communication interface with USB flash drive - 5–12
Figure 5-11 Web page dashboard screen - 5–13
Figure 5-12 Web page firmware upgrade screen - 5–13
Figure A-1 Efficiency curve - 18KW - A–5
Figure A-2 Efficiency curve- 25KW - A–6
Figure A-3 Derating curve- 18KW - A–6
Figure A-4 Derating curve- 25KW - A–7

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Tables

Table 2-1 Packing list- Wiring box - - -

1 Introduction

Chapter 1, “Introduction” provides information about Conext CL18000NA and Conext CL 25000NA three phase grid tie inverters.

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Description of the Conext Grid Tie Solar Inverter

The Conext CL Inverter is a three phase transformerless string inverter designed for high efficiency, easy installation and maximum yield. The inverter converts the solar electric (photovoltaic or PV) power into utility grade electricity that can be used for commercial or residential applications.

The inverter is designed to collect maximum available energy from the PV array by constantly adjusting its output power to track maximum power point (MPP) of the PV array. The inverter has two MPPT channels (MPPT1 and MPPT 2). A maximum of four string inputs can be connected to each independent MPPT channels. The two independent PV arrays can operate at different peak power points, to capture the maximum possible energy. The inverter accommodates PV arrays with open circuit voltages up to 1000 VDC.

The Conext CL is a transformerless design and therefore has no galvanic isolation.

Figure 1-1 shows the major components of a typical PV grid-tie installation, the energy flow in a system using the Conext CL inverter, and the typical wiring box components.

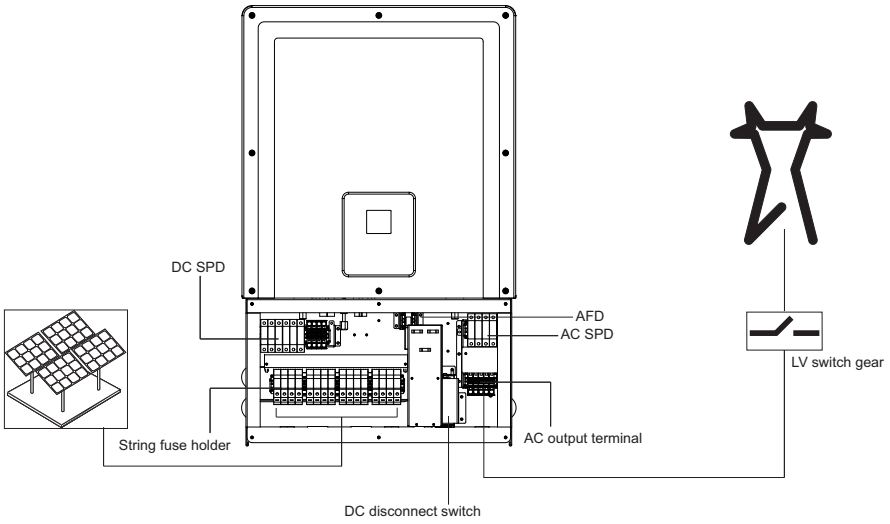

Figure 1-1 Typical installation (Optimum plus Configuration)

For installation details, see ""Installation and Configuration" on page 2–1".

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Key Features

Inverter

- Power rating:
  - Conext CL 18000NA inverter: 18 kVA (600 VDC and 1000 VDC systems)
  - Conext CL 25000NA inverter: 25 kVA (1000 VDC systems)
- PV compatibility: Designed to work with Mono Crystalline or PolyCrystalline panel
- Three-phase (3-Phase + N + PE [ground]), four wire, grid-tie, transformerless
- Wide MPPT voltage range
  - 300- 800 VDC for 18 KVA
  - 500- 800 VDC for 25 KVA
- Supports high array to inverter ratio
- Two independent MPP Trackers with option to combine together
- Energy harvest (MPPT) efficiency: >99%
- Fast sweep MPPT tracking
- Maximum power conversion efficiency: >98%
- Power factor adjustment range: 0.8 capacitive to 0.8 inductive
- Low AC output current distortion (THD < 3%) @ nominal power
- TYPE 4 (electronics)/TYPE 3R (rear portion) protection class for installation in outdoor environments
- -13 to 140° F (-25 to 60° C) operating temperature range
- Flexible installation
  - Inverter and wiring box separable installation
  - Vertical and lay flat installation (10° orientation, from ground plane)*
- Dry Contact (Multi function) relay
- Remote Power Off (RPO)
- Modbus RS485 and Modbus TCP communications
- USB device host for local firmware upgrade
- Custom data Logging (User configurable via USB or Webpage)
- 3” (diagonally) graphical display (LCD) with integrated 7- button control panel
- Embedded Web server via Ethernet (TCP/IP)
- Supports SunSpec Modbus

Wiring Box*

- Integrated DC switch
- Touch safe fuse holder for PV string protection
- DC Arc Fault Detection (AFD)

- AC and DC Surge Protection (SPD) & Monitoring
- Bottom and Side cable entry for easy installation
- AC cable termination using cage clamp terminal block

*For more details about different wiring box configuration and features, refer “Wiring Box Configurations” on page 2–14.

Block Diagram

Figure 1-2 shows the block diagram of Conext CL 18000NA and Conext CL 25000NA inverters. Figure 1-3 and Figure 1-4 shows the location of important physical features of the inverter.

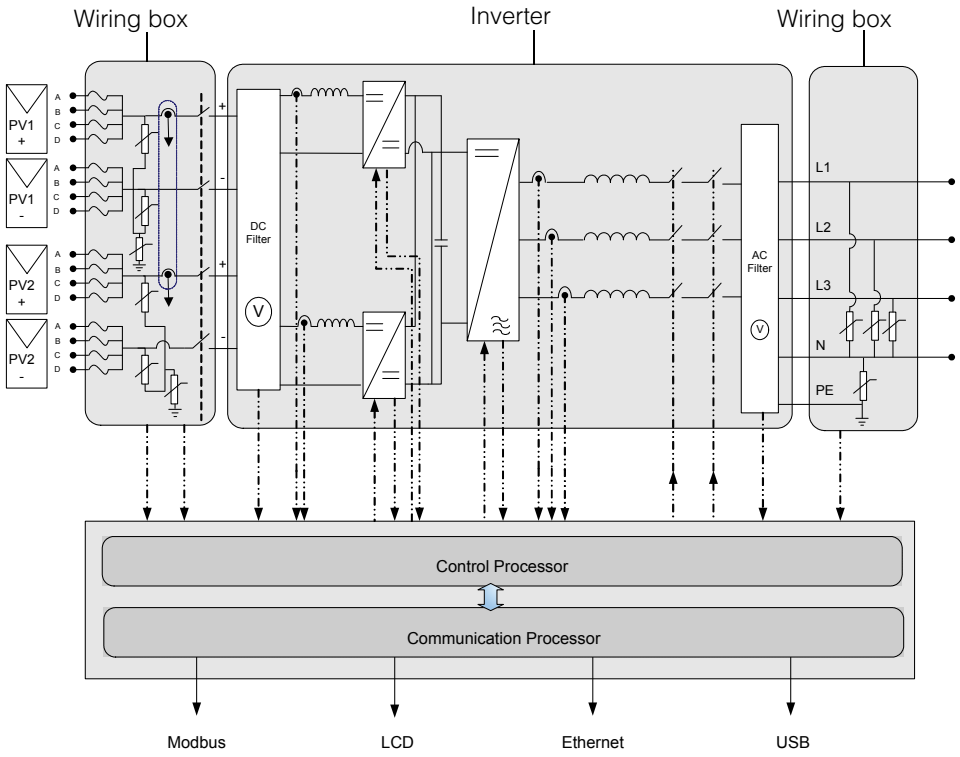

Figure 1-2 Block diagram of the Conext CL 18000NA and 25000NA models

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Physical Features

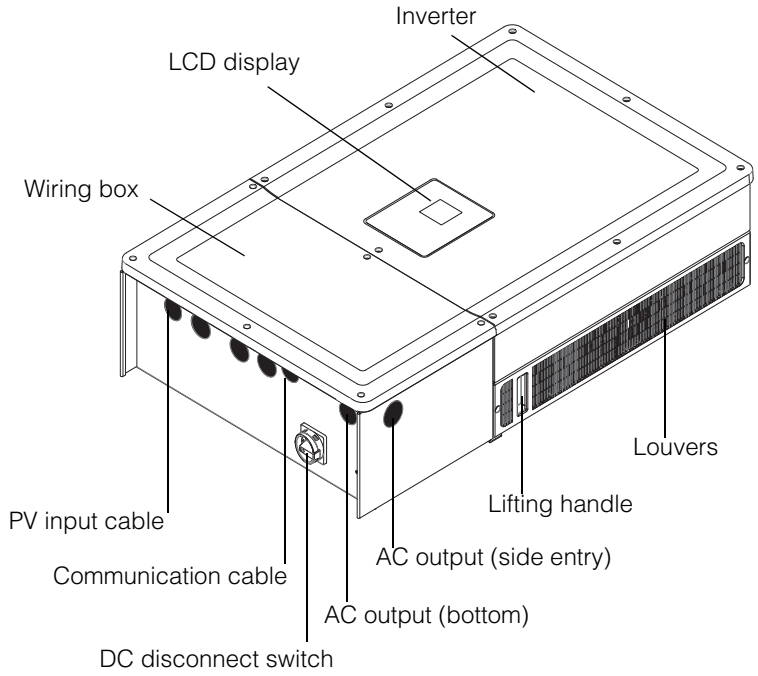

Figure 1-3 Location of physical features of the inverter and the wiring box- right side view

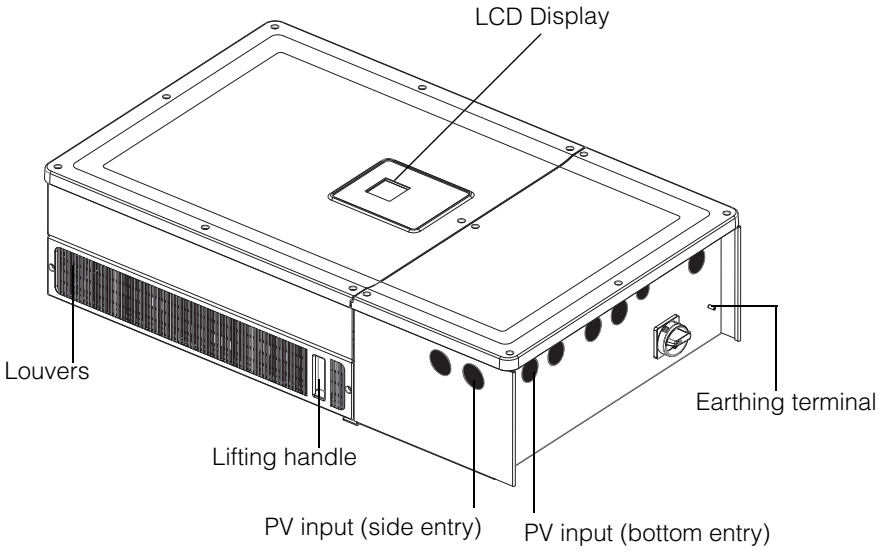

Figure 1-4 Location of physical features of the inverter and the wiring box- left side view

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Air Ventilation

The air intake and outlet are located at the sides of the inverter, as shown in Figure 1-5.

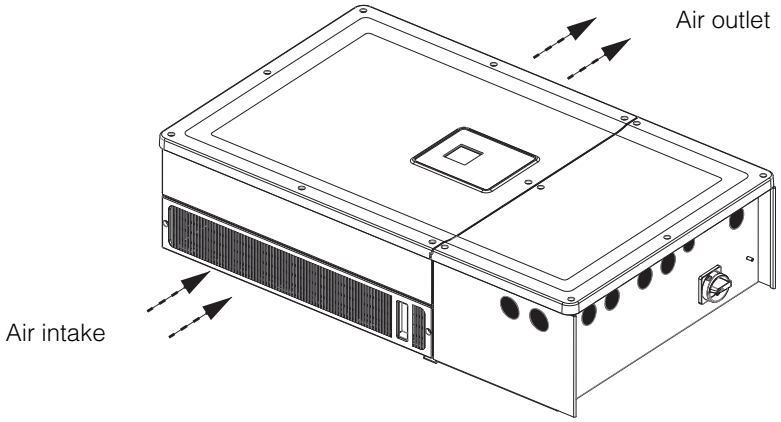

Figure 1-5 Cooling arrangement of the inverter

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Bottom view of Wiring box

The Ingress Protection rated hole plugs are located at the bottom of the wiring box, as shown in Figure 1-6.

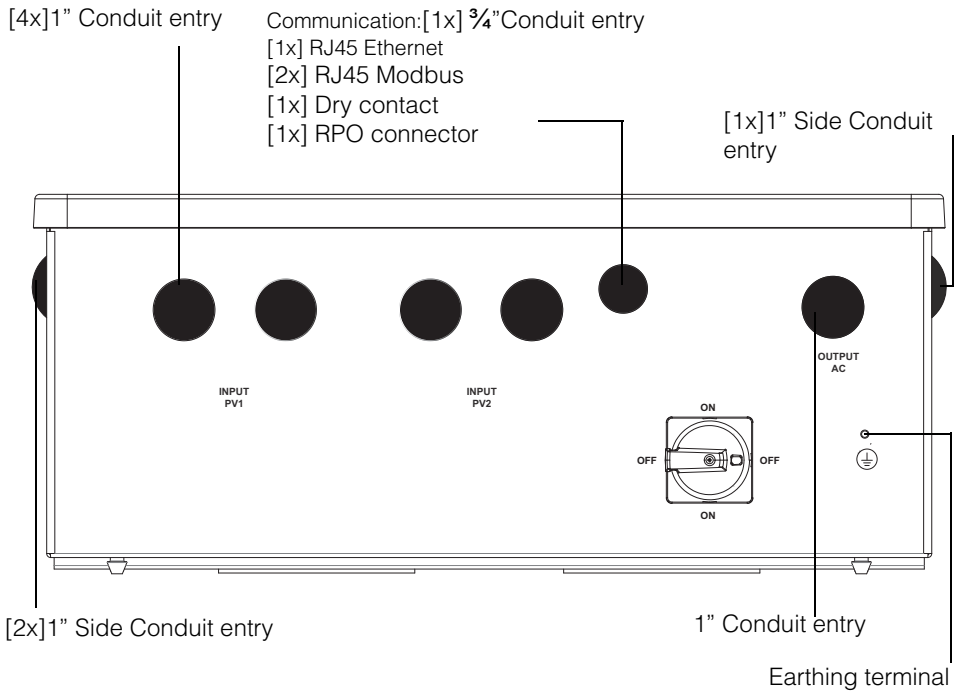

Figure 1-6 Bottom view of the wiring box

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, FIRE OR ARC FLASH

Replace any plugs that are removed and unused, to prevent water from entering the wiring box.

Failure to follow these instructions will result in death or serious injury.

Item	See this section:
AC output	"AC Wiring" on page 2–39
Communication interface	"Communication Interface" on page 2–44
PV input	"Planning" on page 2–34
Earthing terminal	"Earthing Terminal" on page 2–43

2 Installation and Configuration

Chapter 2, “Installation and Configuration” provides information and procedures for installing and configuring the inverter and the wiring box.

This manual is for use by qualified personnel only

Transportation

The Conext CL consists of two packaging boxes, the inverter and the wiring box. The transportation of the equipment should be carried out without any abnormal vibration or shock that may damage any of the internal parts.

Lifting

⚠CAUTION

CRUSH HAZARD

- The service person should be equipped with appropriate PPE.
- Lift the inverter with the help of another person.

Failure to follow these instructions can result in moderate or serious injury.

The inverter and the wiring box weighs approximately 119 lbs (54 kg) and 33 lbs (15 kg) respectively. It is recommended to ensure all necessary precautions for personal as well as equipment safety while lifting, to avoid any mishandling and physical injury.

Do not attempt to lift multiple inverters together.

Package Inspection

1. Check the wiring box and the inverter for damage during shipping. If it is damaged beyond cosmetic damage, contact Schneider Electric.
2. Check the nameplate label on the wiring box and the inverter for correctness of the model ordered, see Figure 2-2 and Figure 2-5.
3. Fill in “Information About Your System” on page D–1.

Wiring box

Scope of delivery

While unpacking the wiring box, verify that the package includes all the items as listed in the table below.

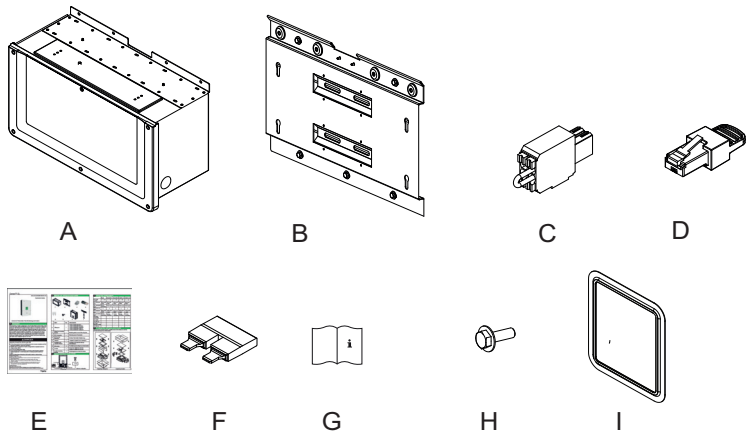

Figure 2-1 Packing list- Wiring box

Table 2-1 Packing list- Wiring box

	Item/ Description	Quantity
A	Wiring box	1
B	Wiring box mounting bracket	1
C	Relay and RPO connector	1
D	Modbus RC terminator (RJ45 plug)	1
E	Quick start guide	1
F	MPPT shorting jumper	2
G	Installation and Operation manual	1
H	M8 screws (8 mm) for fastening wiring box to the bracket	4
I	Silicone layer for LCD panel	1

Wiring box Nameplate

The nameplate* affixed to the wiring box provides the following information:

- Model name
- Configuration
- Enclosure type
- Part number

*A typical nameplate is as shown below.

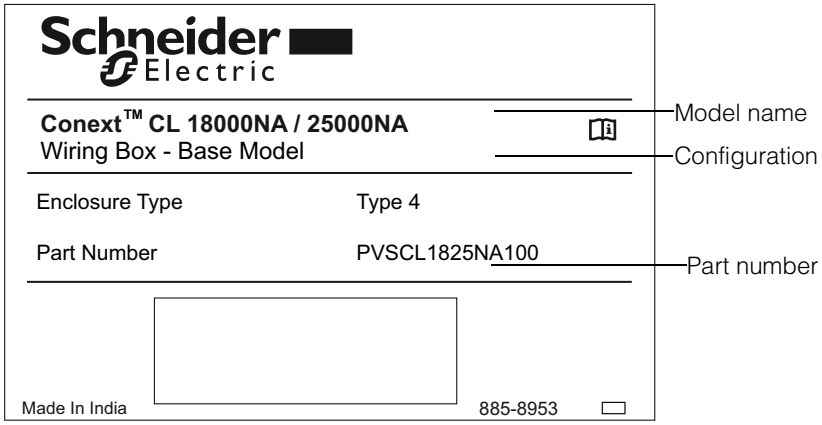

Figure 2-2 Nameplate label- Wiring box

Note: Technical data in this manual is subject to change. Always refer the label affixed on the product.

Wiring box SKU/ Order Code **	Configuration
PVSCL1825NA100	Base
PVSCL1825NA200	Essential
PVSCL1825NA201	Essential plus
PVSCL1825NA300	Optimum
PVSCL1825NA301	Optimum plus

** Refer wiring box name plate for the correct part number ordered.

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Inverter

Scope of delivery

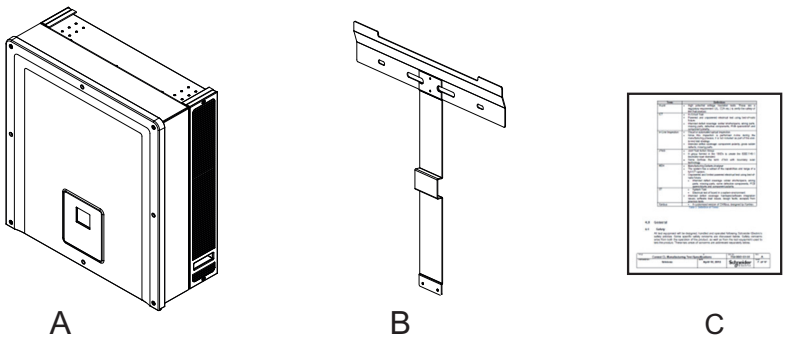

Figure 2-3 Packing list- Inverter

Table 2-2 Packing list- Inverter

	Item/ Description	Quantity
A	Inverter	1
B	Inverter mounting bracket	1
C	Routine test report	1

Packaging label

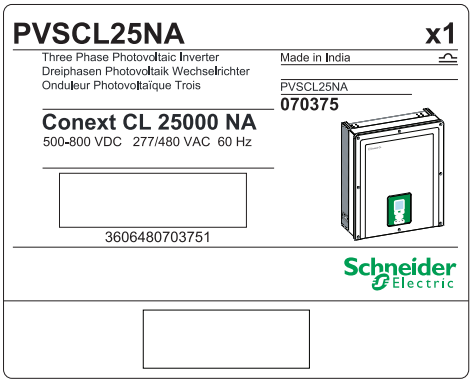

Figure 2-4 Inverter packaging label

Nameplate

The nameplate* shown below is affixed to the inverter and provides the following information:

This manual is for use by qualified personnel only

- Model name
- Part number
- DC input data
- AC output data
- Certification

*A typical nameplate is as shown below in Figure 2-5.

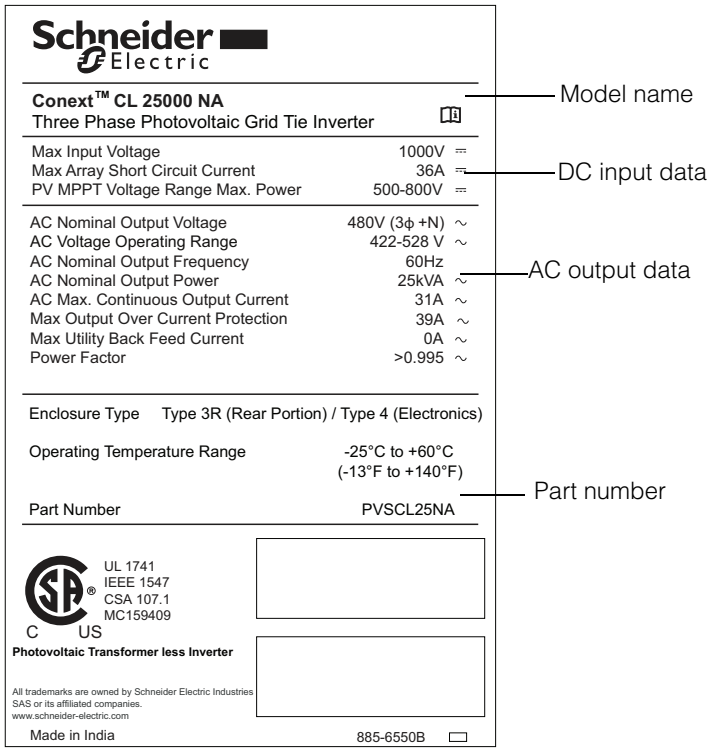
Schneider Electric
Conext™ CL 25000 NA
Three Phase Photovoltaic Grid Tie Inverter
Max Input Voltage 1000V
Max Array Short Circuit Current 36A
PV MPPT Voltage Range Max. Power 500-800V
AC Nominal Output Voltage 480V (3ϕ +N)
AC Voltage Operating Range 422-528 V
AC Nominal Output Frequency 60Hz
AC Nominal Output Power 25kVA
AC Max. Continuous Output Current 31A
Max Output Over Current Protection 39A
Max Utility Back Feed Current 0A
Power Factor >0.995
Enclosure Type Type 3R (Rear Portion) / Type 4 (Electronics)
Operating Temperature Range -25°C to +60°C (-13°F to +140°F)
Part Number PVSCL25NA
UL 1741
IEEE 1547
CSA 107.1
MC159409
C US
Photovoltaic Transformer less Inverter
All trademarks are owned by Schneider Electric Industries SAS or its affiliated companies.
www.schneider-electric.com
Made in India
885-6550B
Model name
DC input data
AC output data
Part number

Figure 2-5 Inverter nameplate label

Note: Technical data in this manual is subject to change. Always refer the label affixed on the product.

Planning for Installation

Installation Overview

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, FIRE OR ARC FLASH

The Conext CL inverter must be installed and serviced only by qualified personnel equipped with appropriate personal protective equipment and following safe electrical work practice and all applicable code requirements.

Failure to follow these instructions will result in death or serious injury.

NOTICE

RISK OF EQUIPMENT DAMAGE

In the Base model, string fuse protection and DC disconnect switch are not available. Ensure that suitable external protection is installed as per local installation standards.

Failure to follow these instructions can result in equipment damage.

Installation Options

The Conext CL inverter can be installed as a single inverter with a maximum of four PV strings connected to each MPPT. In the Base model wiring box, when more than two strings are connected to each MPPT, the use of a suitably rated external fuse is recommended. The inverter can also be installed in a multiple inverter system. If multiple inverters are used, each of the inverter must be wired to an independent set of PV array. To enable communication between the Conext CL inverters, network cabling must be installed to the RJ45 ports.

Installation Codes

Ensure adherence to all necessary installation codes as applicable to the specific location of installation. Some examples include the following:

- The U.S. National Electrical Code (NEC)
- The Canadian Electrical Code (CEC)
- The U.S. Code of Federal Regulations (CFRs)
- Canadian Standards Association (CSA)

It is the responsibility of the installer to ensure that all the applicable installation requirements are met.

Planning

Planning for a system requires a complete understanding of all the components that are involved to successfully install the inverter. This helps to achieve optimum performance and reliability, and to meet applicable installation codes.

Location

The inverter is rated and certified for both indoor and outdoor installation. The Conext CL inverter uses a TYPE 4 (electronics)/ TYPE 3R (rear portion) rated protection, that can be installed indoors or outdoors.

Debris Free

Excessive debris (such as dust, leaves, and cobwebs) can accumulate at the rear side of the inverter, interfering with the wiring connections and ventilation.

NOTICE
RISK OF EQUIPMENT DAMAGE Mount the inverter in a dust free environment where debris cannot accumulate which may interfere with the connections and ventilation. **Failure to follow these instructions can result in equipment damage.**

Clearance

Consider adequate ventilation and service access when installing the inverter. Refer to the “Wiring Box Configurations” on page 2–14.

Environmental Requirements

⚠WARNING
HAZARD OF FIRE Keep the area under and around the inverter clear of flammable material and debris. **Failure to follow these instructions can result in death or serious injury.**

- The enclosure of the inverter can tolerate some ingress of dust, however, minimizing the exposure to dust will improve the performance and life of the inverter.
- While the TYPE 4 (electronics)/ TYPE 3R (rear portion) rated protection of the inverter protects it from rain and water sprayed on the inverter from a nozzle, it is recommended that outdoor installations be located away from lawn sprinklers and other sources of spray such as a hose or pressure washer.
- The inverter is designed to operate in a -68 °F to 140 °F (-25 °C to 60 °C) ambient environment, however, the optimal power harvest is achieved up to an ambient temperature of 113 °F (45 °C). Above 45 °C, the power may derate.
- It is recommended to install the inverter away from direct exposure to sunlight; or else it might result in the following consequences:
  - output power limitation (loss of production).
  - premature aging of electronic components.
  - premature aging of mechanical components and the display interface.
- The mounting location and structure must be suitable to withstand the weight of the inverter and the wiring box.
- Install the inverter in a location where the DC disconnect switches are easily accessible.

- Install the inverter with the display located at an eye level so that the display and LED status are seen easily.

⚠ CAUTION

CRUSH HAZARD

- The inverter and wiring box together weighs approximately 154.3 lbs (70 kg). Ensure that the surface on which the inverter will be mounted, and the mounting hardware used, are strong enough to withstand this weight.
- Use proper lifting techniques in accordance with local workplace safety rules, and always use assistance when moving, lifting and installing the inverter.

Failure to follow these instructions can result in injury, or equipment damage.

NOTICE

RISK OF EQUIPMENT DAMAGE

- The enclosure of the inverter protects the internal parts from rain; however, outdoor installations must be located away from the lawn sprinklers and other sources of spray such as a garden hose or a pressure washer.
- Direct sunlight on the inverter could raise internal temperatures, causing a reduction of output power during hot weather. It is recommended to install the inverter in a shaded area, away from direct exposure to sunlight for better performance.
- The performance of the product might be impaired without adequate ventilation. Allow a clearance of at least 23.6 in (600 mm) at the sides of the inverter.
- Do not obstruct the air intakes and outlets.

Failure to follow these instructions can result in equipment damage.

Improper Usage

It is recommended not to install the Conext CL inverter under the following conditions:

- Environment with flammable conditions.
- Usage of substandard safety devices along with the equipment.
- Installation of the inverter in conjunction with other equipment which is not recommended in this user manual or not meant for this application.
- Installation or handling the inverter without proper understanding of the procedure specified in this manual.
- Improper installation clearance between adjacent inverters.

- In corrosive environments, including but not limited to acidic rain and chemical plants.

⚠ DANGER

HAZARD OF CRUSH OR STRAIN

Follow the correct procedures when lifting, moving, or mounting the inverter.

Failure to follow these instructions will result in death or serious injury.

NOTICE

RISK OF EQUIPMENT DAMAGE

When removing the inverter, place it on cardboard to prevent cosmetic damage to the back surface.

Failure to follow these instructions can result in equipment damage.

Correct Mounting Position

NOTICE

RISK OF EQUIPMENT DAMAGE

- Mount the inverter only upright or at an angle of 10 degrees with reference to a ground plane (plastic louvers facing downward) and only on a flat surface.
- Do not install the inverter horizontally.
- Local codes might impose additional mounting requirements in case of earthquake or other high-risk areas.

Failure to follow these instructions can result in poor performance or damage to equipment.

The correct mounting position is as shown in Figure 2-6. Examples of incorrect positions are shown in Figure 2-7. The inverter does not require any clearance at the rear side and it may be mounted flat on a surface with a minimum of 10^0 inclination. Install the device at eye level for optimum user comfort.

Note: For lay flat installation, it is recommended to install the inverter on a Power Rack and PowerSkid (not included in the package). The ordering details for Power Rack and PowerSkid: Part number: BTK10-IPS-SCH-XX. For more details, http://www.benteksolar.com.

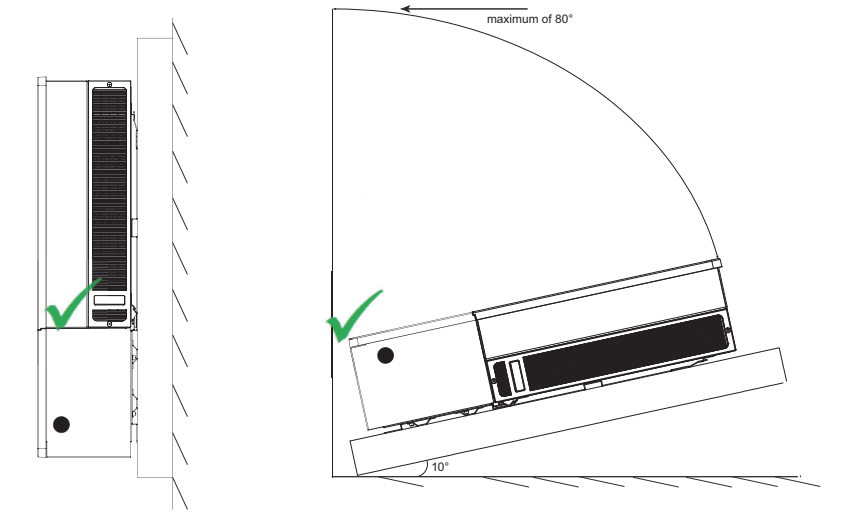

Figure 2-6 Correct mounting position

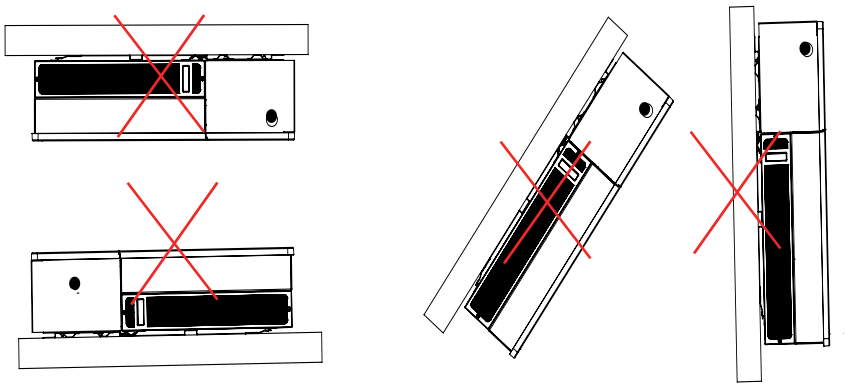

Figure 2-7 Incorrect mounting positions

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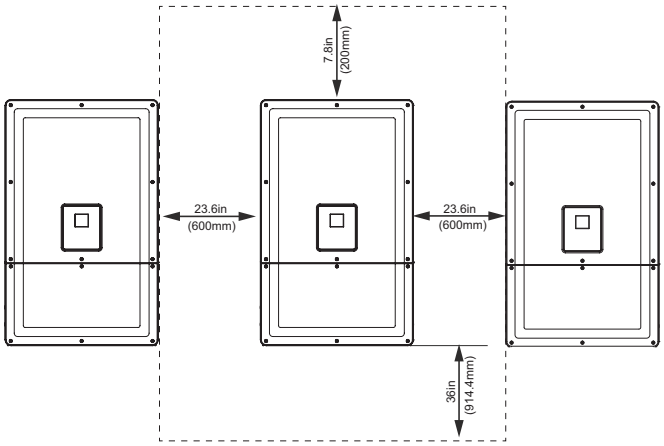

Figure 2-8 Proper installation distances of the inverter

For side by side inverter installations, maintain a minimum distance of 23.6 in (600 mm) between the inverters to minimize the possibility of power derating.

Dimensions

The dimensions of the inverter are as shown in Figure 2-9.

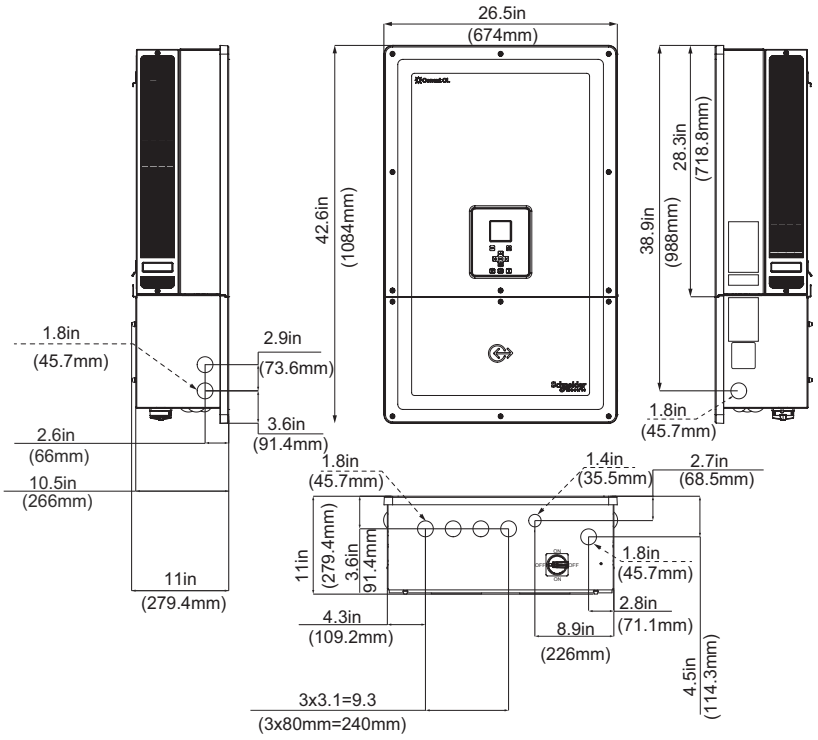

Figure 2-9 Views and dimensions of the inverter and the wiring box

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Wiring Box Configurations

There are five models of the wiring box available for the Conext 18000NA and Conext 25000NA products.

		Base	Essential	Essential plus	Optimum	Optimum plus
Cable Entry	Bottom	✓	✓	✓	✓	✓
	Side	✓	✓	✓	✓	✓
DC connection	Knock-out size	1”	1”	1”	1”	1”
	Conductor size	#10 to #6 AWG	#10 to #4 AWG	#10 to #4 AWG	#10 to #4 AWG	#10 to #4 AWG
	Connection type	Spring connector	Screw type	Screw type	Screw type	Screw type
	Single MPPT configuration	✓	✓	✓	✓	✓
AC connection	Knock-out size	1”	1”	1”	1”	1”
	Conductor size	#10 to #4 AWG	#10 to #4 AWG	#10 to #4 AWG	#10 to #4 AWG	#10 to #4 AWG
	Connection type	Spring connector	Spring connector	Spring connector	Spring connector	Spring connector
DC protection	Touch-safe fuse holder		✓	✓	✓	✓
	DC switch		✓	✓	✓	✓
	DC SPD (Two)				✓	✓
	Arc Fault Detection (AFD)			✓		✓
AC protection	AC SPD (One)				✓	✓

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The different features of the five wiring box layouts are as shown below:

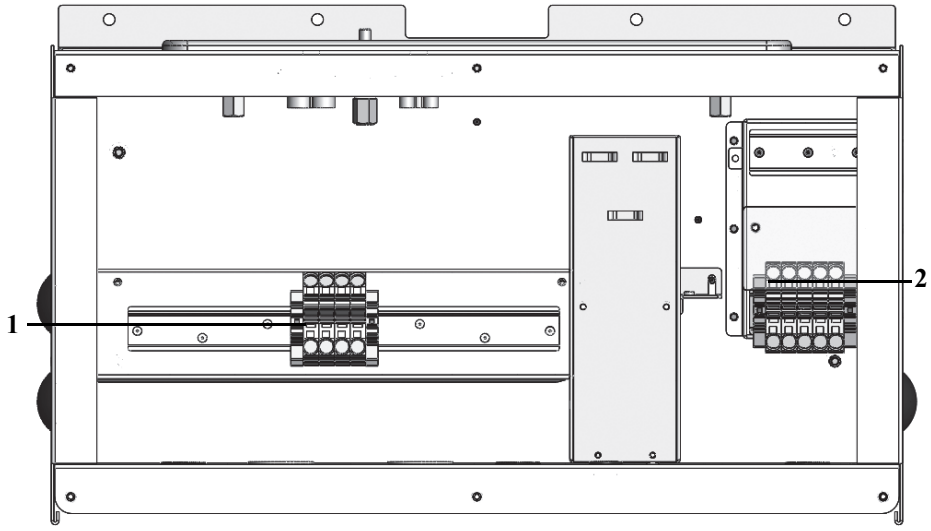

Figure 2-10 Wiring box- Base (PVSCL1825NA100)

Table 2-3 Wiring box- Base (PVSCL1825NA100)

Ref:	Description
1	DC terminal block
2	AC terminal block

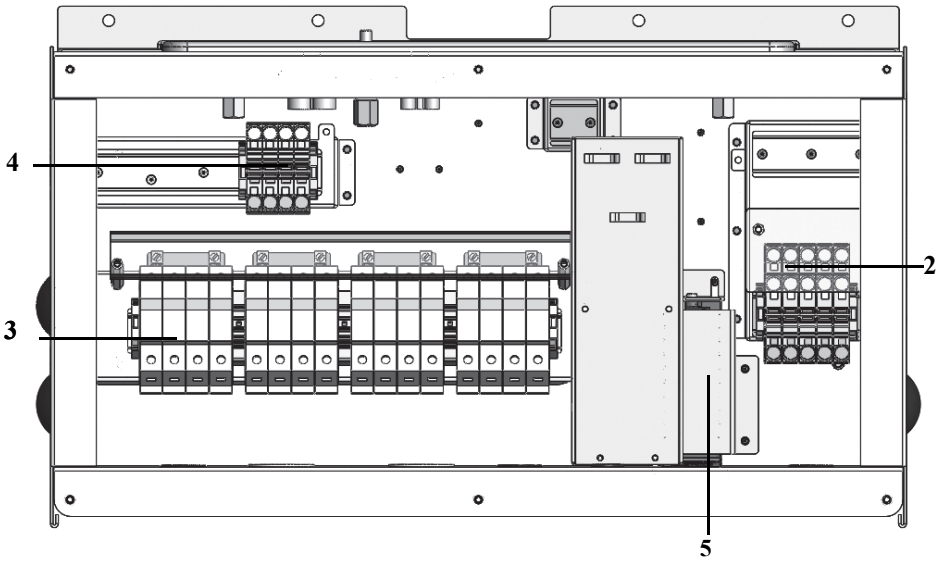

Figure 2-11 Wiring box- Essential (PVSCL1825NA200)

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Table 2-4 Wiring box- Essential (PVSCL1825NA200)

Ref:	Description
2	AC terminal block
3	DC fuse holder
4	MPPT shorting terminal block
5	DC disconnect switch

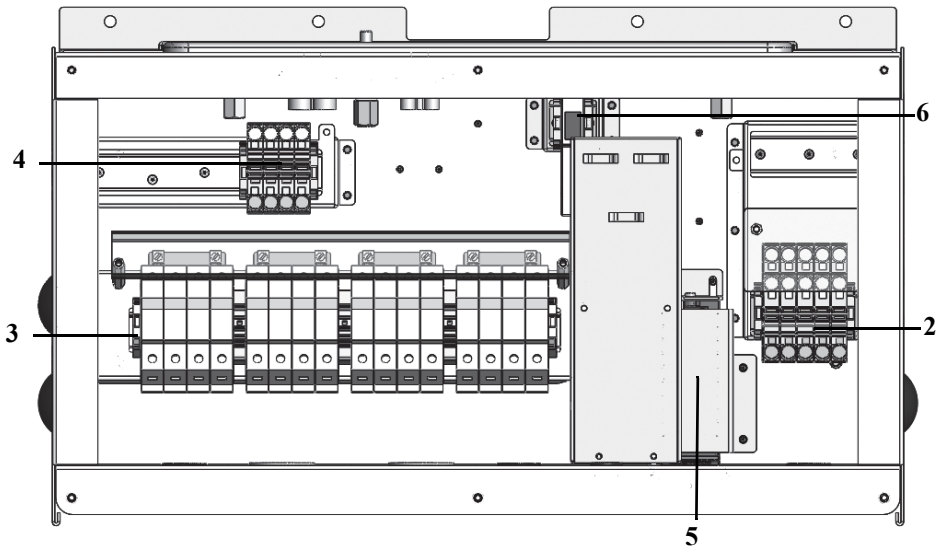

Figure 2-12 Wiring box- Essential plus (PVSCL1825NA201)

Table 2-5 Wiring box- Essential plus (PVSCL1825NA201)

Ref:	Description
2	AC terminal block
3	DC fuse holder
4	MPPT shorting terminal block
5	DC disconnect switch
6	AFD - Arc Fault Detector

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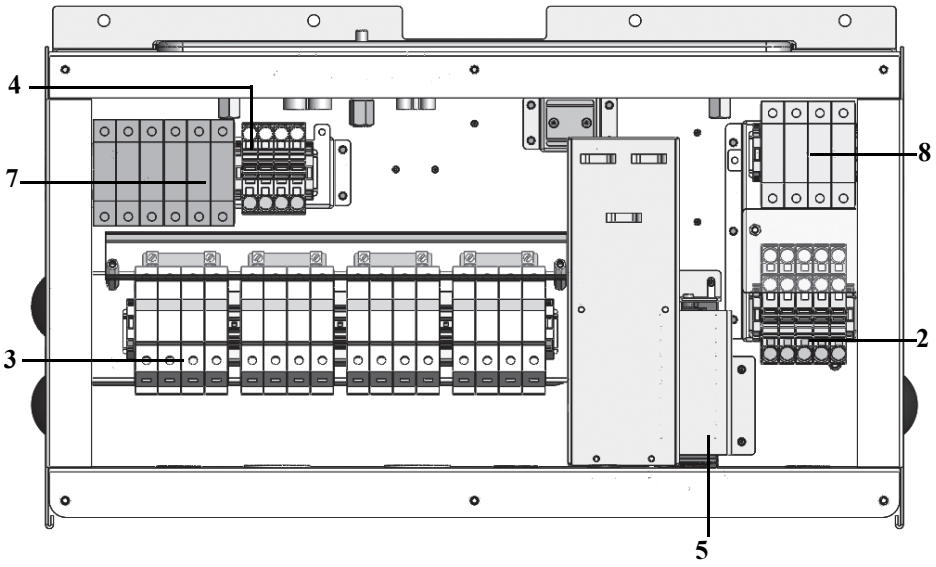

Figure 2-13 Wiring box- Optimum (PVSCL1825NA300)

Table 2-6 Wiring box- Optimum (PVSCL1825NA300)

Ref:	Description
2	AC terminal block
3	DC fuse holder
4	MPPT shorting terminal block
5	DC disconnect switch
7	DC SPD - Surge protection device
8	AC SPD - Surge protection device

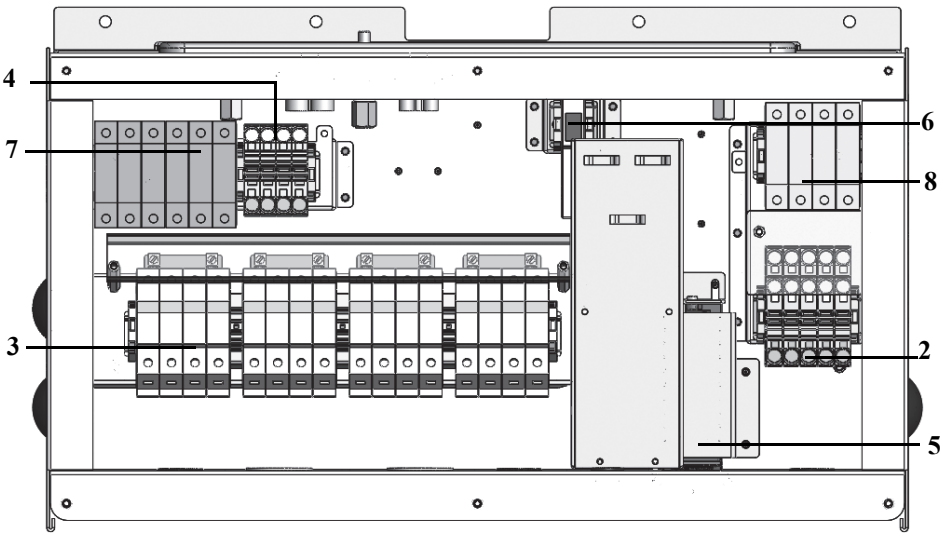

Figure 2-14 Wiring box- Optimum plus (PVSCL1825NA301)

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Table 2-7 Wiring box- Optimum plus (PVSCL1825NA301)

Ref:	Description
2	AC terminal block
3	DC Fuse holder
4	MPPT shorting terminal block
5	DC disconnect switch
6	AFD - Arc Fault Detector
7	DC SPD - Surge protection device
8	AC SPD - Surge protection device

Tools Required

To install the inverter, the following tools are required:

- Slotted screwdriver set
- #2 Phillips screwdriver or power screwdriver for mounting the bracket
- Flat screw driver (~1/4" wide)
- Wire stripper and crimping tool for both AC and DC wiring
- Bubble level or Spirit level to ensure the straight installation of the mounting bracket
- Torque adjustable wrench (metric)
- Torx head screw driver T25

Torque Table

Table 2-8 Torque table

Fastener Type	Description	Torque Nm/ in-lbf
M5	Wiring box front cover screw	2.75/ 24.3
M8	Wiring box and wall mount screw	6/ 53.1
M8	Inverter and Wiring box bracket screws	6/ 53.1
Guide Bushing screw	Inverter and Wiring box guide bushing locking screw	10/ 88.5
Thumb screw	Inverter and Wiring box power connector thumb screw	5/ 44.3
M6 Nut	Second protective equipment grounding	5/ 44.3
Phillips head (#2)	Fuse holder termination screw	3/ 26.6

Mounting

This section describes how to mount the inverter and the wiring box to the mounting surface.

⚠ CAUTION

CRUSH HAZARD

- Always use the specified and sufficient number of screws to install the mounting brackets.
- Ensure to fasten the mounting bracket tightly to the wall or mounting structure.
- The service person should be equipped with appropriate PPE.
- Lift the inverter with the help of another person.

Failure to follow these instructions can result in moderate or serious injury.

Fastening the Mounting Plate to the Wall

To fasten the mounting plate to the wall:

Install the wiring box mounting bracket first, and then mount the inverter bracket using the locating pins.

1. Select a wall or other suitable, solid, vertical surface capable of supporting the weight of the inverter and the wiring box.
2. Maintain a minimum clearance of 36” from the ground to the bottom edge of the wiring box mounting bracket. Refer to the Figure 2-15 on page 2–20.
3. Using the five M8 screws, securely attach the wiring box mounting bracket to the mounting surface. An example of mounting on plywood, wallboard, and wall studs is shown in Figure 2-16 on page 2–21.
4. Align the inverter mounting bracket using the two alignment pins. Refer to the Figure 2-17 on page 2–22.
5. Secure the bracket to the mounting surface using two M8 screws. An example of mounting on plywood, wallboard, and wall studs is shown in Figure 2-17 on page 2–22.
6. Use a level to ensure that the mounting bracket is horizontal.

Dimensions of the Mounting Brackets

The dimensions of the mounting brackets are as shown in figure below.

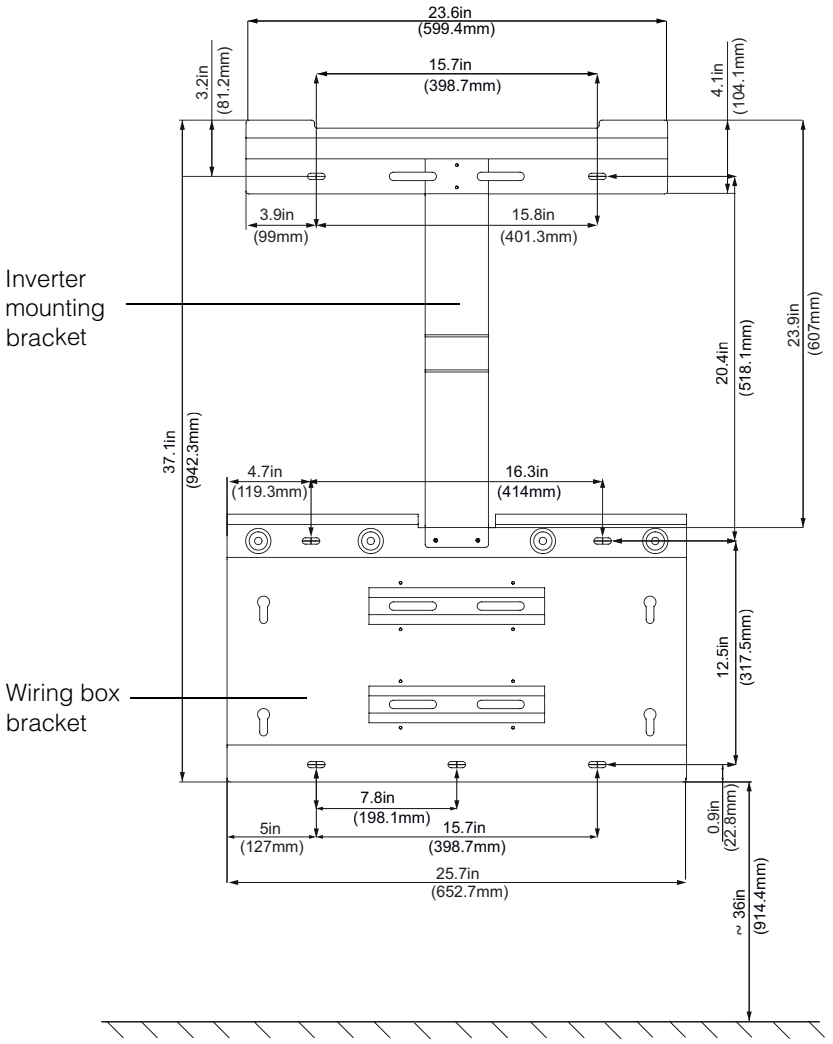

Figure 2-15 Mounting bracket dimensions- Wiring box and Inverter

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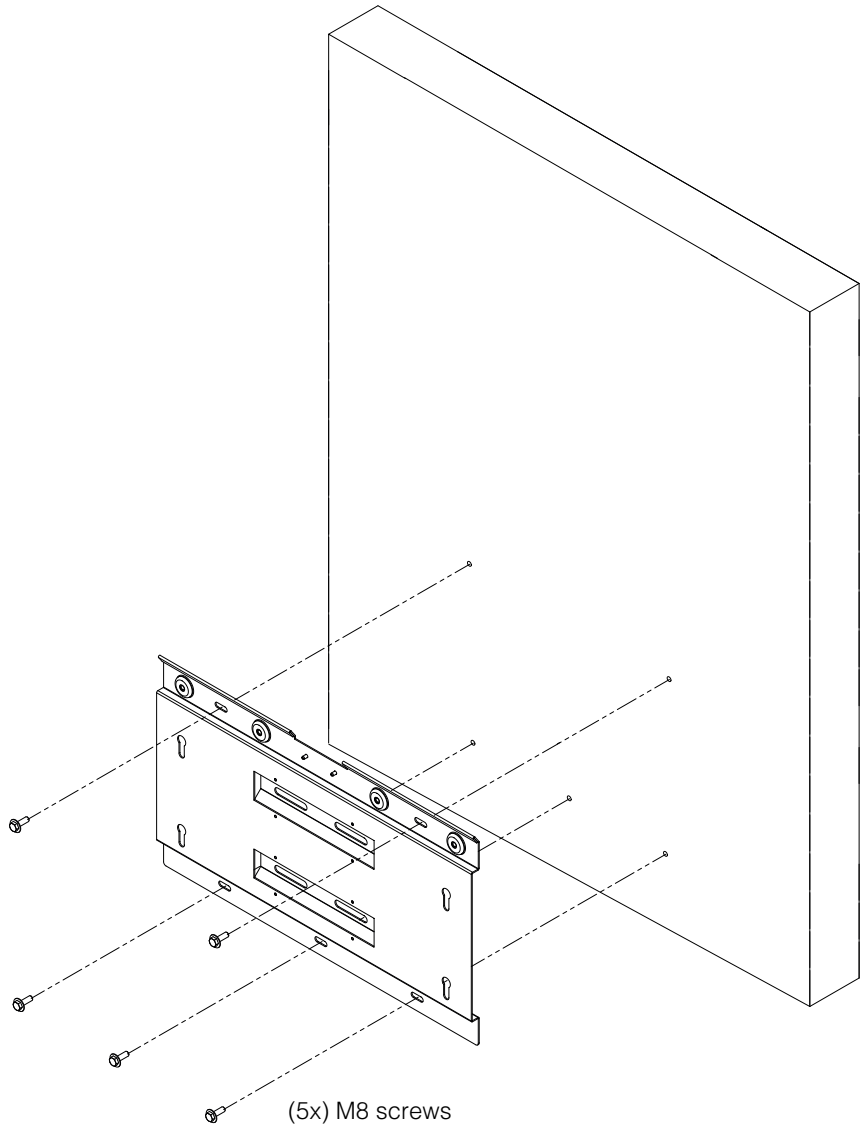

Figure 2-16 Fastening the wiring box mounting plate to the wall

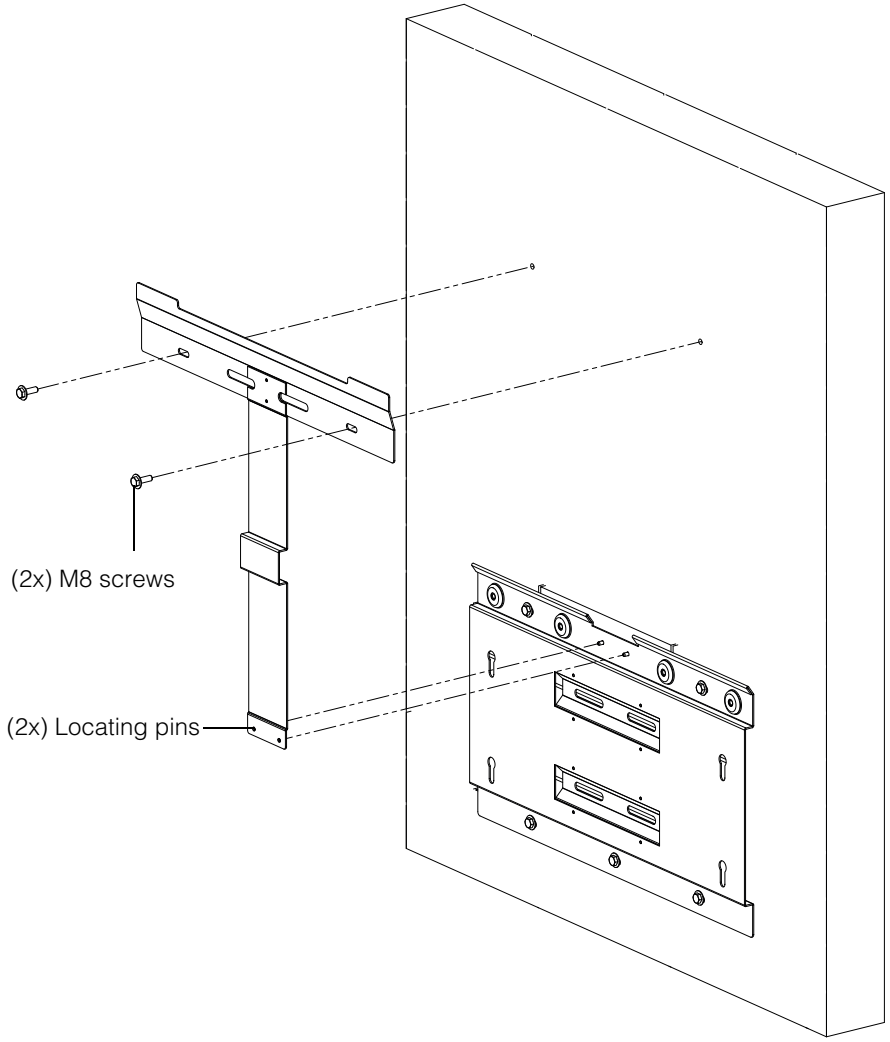

Figure 2-17 Fastening the inverter mounting plate to the wall

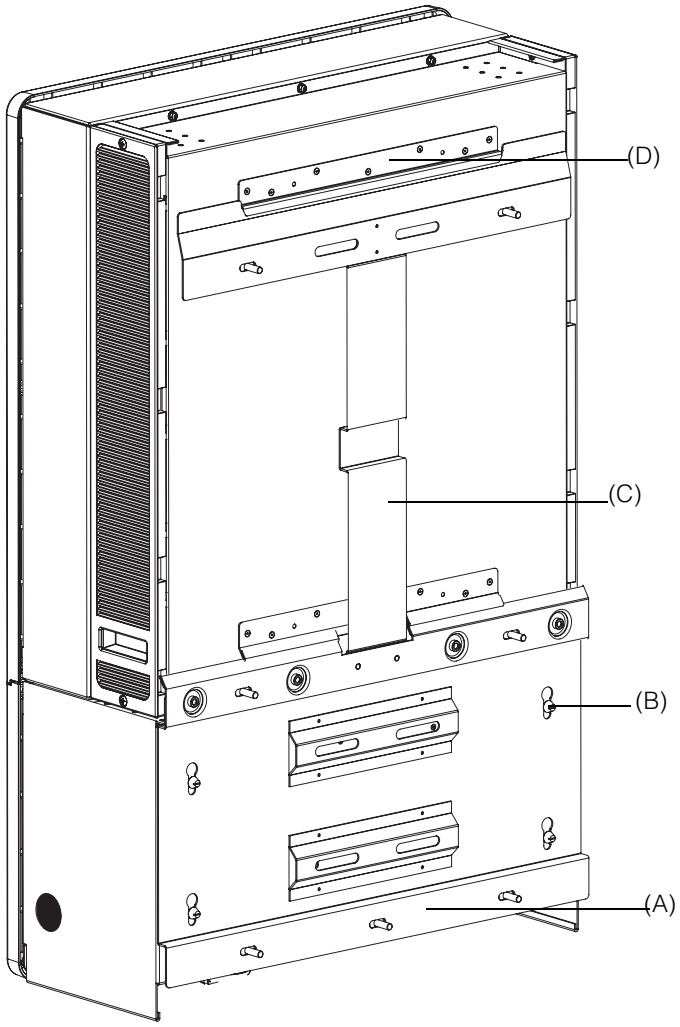

Figure 2-18 Inverter rear view with mounting bracket

(A) Mounting bracket- wiring box

(B) Locating pin

(C) Mounting bracket - inverter

(D) Mounting flange

Pole Mounting

The Conext CL inverter can be mounted on a pole structure with three additional U-clamps. (not included in the package).
The ordering details for U-clamp: Part number: 3042T67
(for a pole diameter of 6”).
For more details, http://www.mcmaster.com/#catalog/121/1564/=xcg6cl

The installation details for U-clamp with the inverter and wiring box mounting bracket are as shown below. The U-clamp grips the entire circumference of the pole for a secure hold. It has two locking nuts; additional hex nuts can be added.

The Conext CL inverter is tested with McMaster U-clamps for a pole size of 6” diameter.

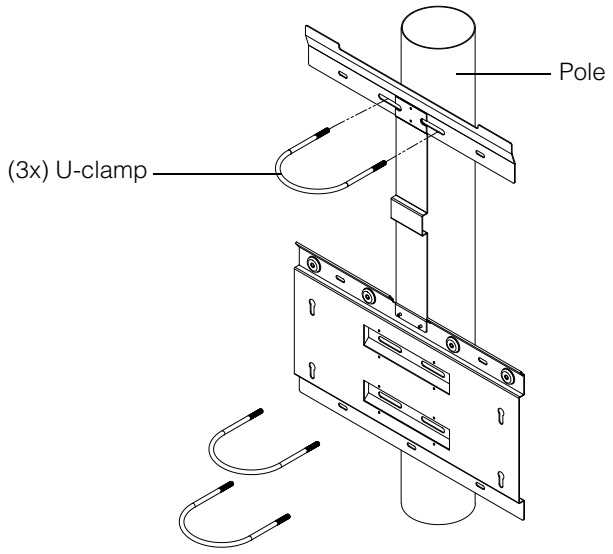

Figure 2-19 Front view of the pole mounting installation

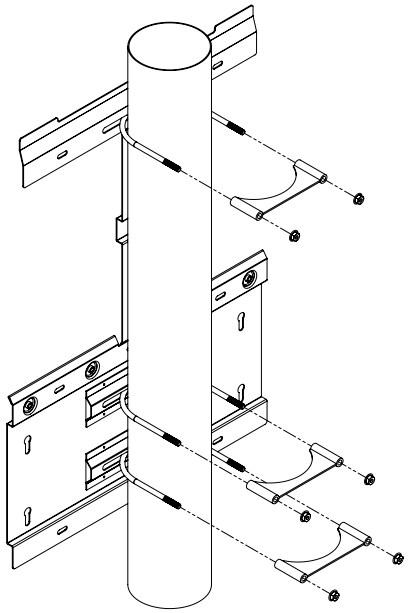

Figure 2-20 Rear view of the pole mounting installation

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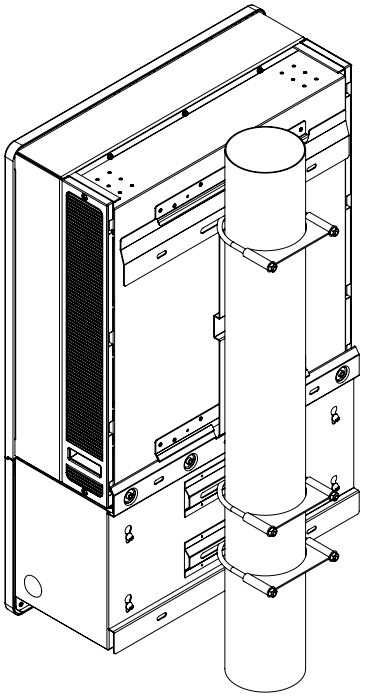

Figure 2-21 Pole mounting- rear view with the inverter installed

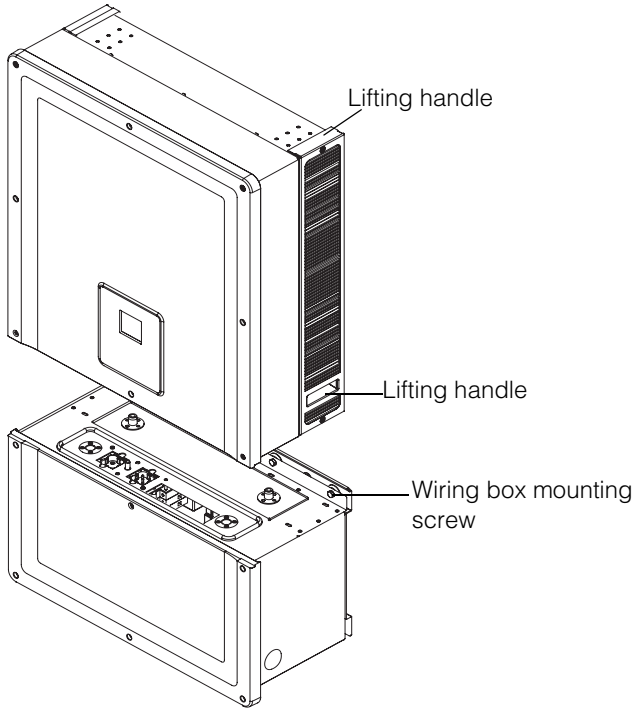

Figure 2-22 Inverter and Wiring box- Exploded view

Mounting the Wiring box and Inverter

To mount the wiring box

1. Align the locating pins of the wiring box to the mounting slots on the lower mounting bracket. Refer to the Figure 2-23 on page 2–27.
2. Slide down the wiring box to stay on the mounting bracket.
3. Secure the wiring box in place and tighten using the four M8 screws firmly, as shown in Figure 2-24 on page 2–28. Refer to the Table 2-8, “Torque table” on page 2–18 for torque values.
4. Open the front cover of the Wiring box as shown in Figure 2-25 on page 2–28.
5. Remove the connector cover by loosening the guide bushing as shown in Figure 2-26 on page 2–29.
6. Anchor the connector cover as shown in Figure 2-27 on page 2–29.

   Note: This plate is required to prevent dust and water ingress, when the inverter is removed for service.

⚠ CAUTION

PINCH HAZARD

- Use extreme caution while lifting the inverter.
- Ensure that the inverter mounting hook fully engages with the mounting plate.
- After placing the inverter into the mounting bracket, carefully release your hands off the lifting provision.

Failure to follow these instructions can result in moderate or serious injury.

To mount the inverter

1. Lift the inverter using the lifting provision as shown in Figure 2-22 on page 2–25.
2. Place the inverter on the mounting bracket, and ensure that the upper edge of the mounting bracket engages the flange on the upper edge at the back of the inverter. Refer to the Figure 2-18 on page 2–23.
3. Ensure that the guide bushing (2x) provided with the inverter engages with the wiring box bushing. Refer to the Figure 2-28 on page 2–30 and Figure 2-29 on page 2–30.
4. Tighten the guide bushing screw of the wiring box as shown in Figure 2-30 on page 2–31. Ensure that the inverter and the wiring box are clamped/ fixed together firmly. Refer to the Table 2-8, “Torque table” on page 2–18 for torque values.
5. Lock the inverter and the wiring box power connectors using the thumb screw provided as shown in Figure 2-31 on page 2–31.

Note: Ensure to use the correct torque values, refer to the Table 2-8 on page 2–18.

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, FIRE AND EQUIPMENT DAMAGE

Ensure to tighten the power connector between the inverter and the wiring box and avoid poor electrical contact.

Failure to follow these instructions will result in death or serious injury.

6. Complete the DC, AC, equipment ground connection and Communication Interface connections as described in the following sections. Refer to the page 2–32.
7. Close the front cover as shown in Figure 2-32 on page 2–32. Ensure that the front cover is fastened correctly as per the specified torque value. For torque values, refer to the Table 2-8, “Torque table” on page 2–18.
8. Peel off the adhesive backing and fix the silicone layer (provided along with the packaging) on the LCD panel as shown in Figure 2-33 on page 2–32.

Note:

- Clean the surface of the LCD panel before affixing the silicone layer.
- The clarity of the display might be reduced after fixing the label.

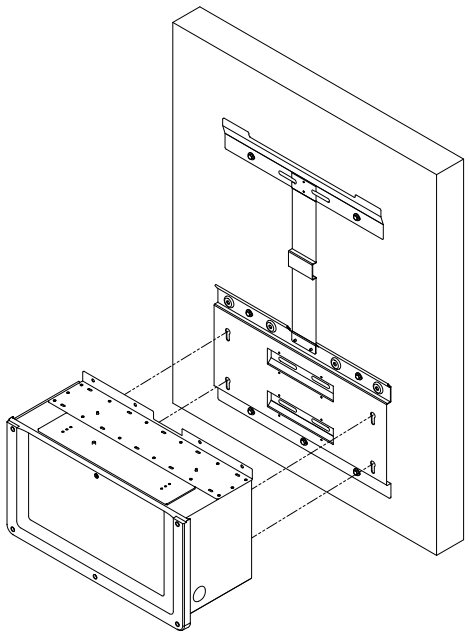

Figure 2-23 Mounting the wiring box on the bracket

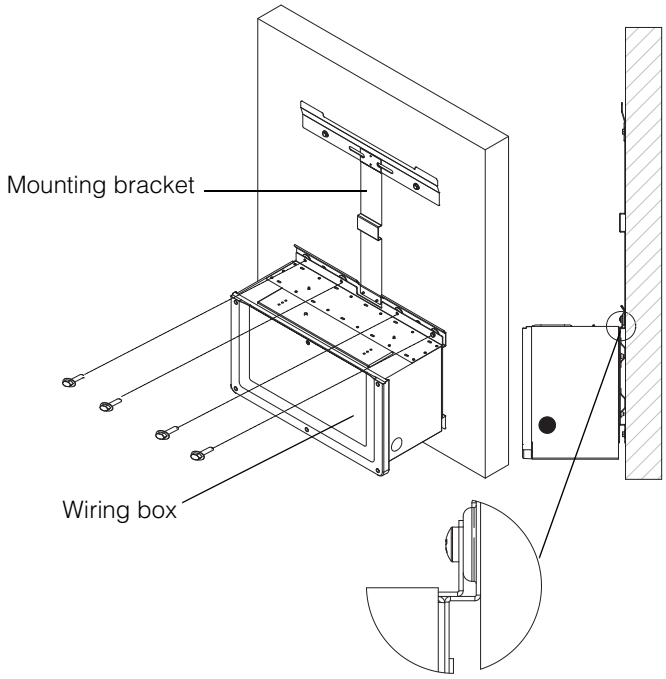

Figure 2-24 Fastening the wiring box to the mounting bracket

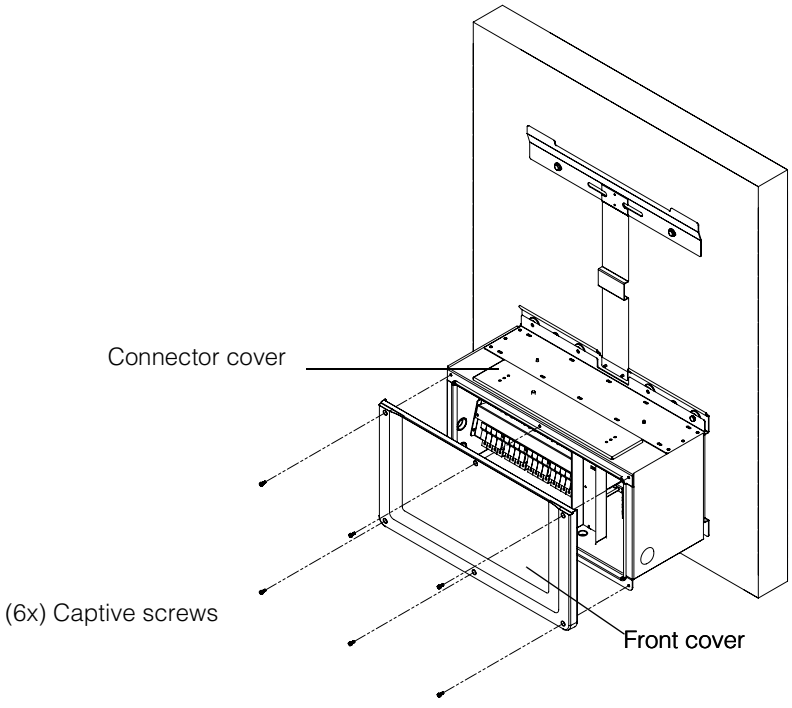

Figure 2-25 Opening the front cover of the wiring box

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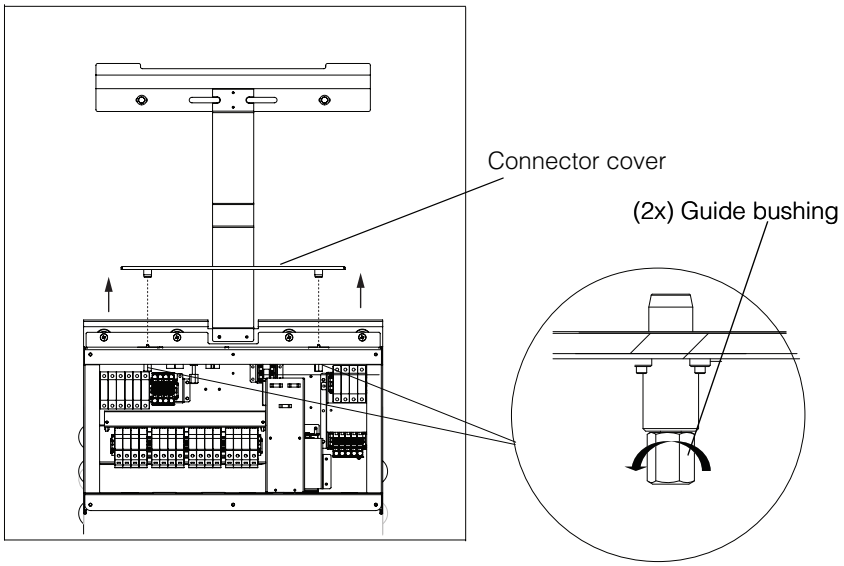

Figure 2-26 Removing the connector cover

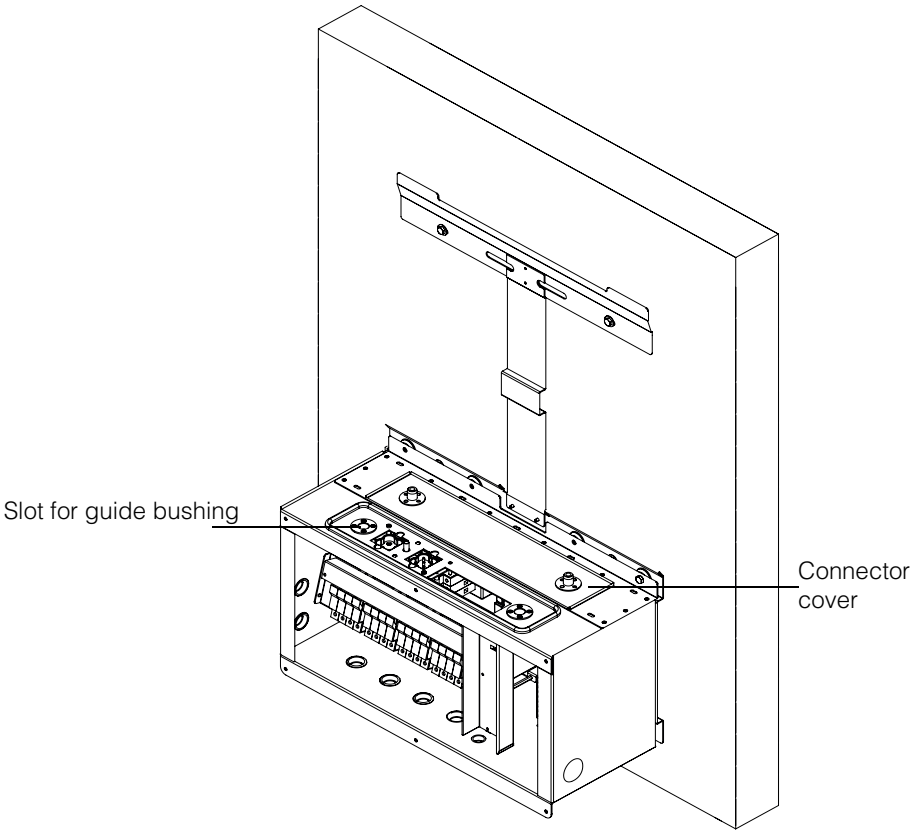

Figure 2-27 Anchoring the connector cover

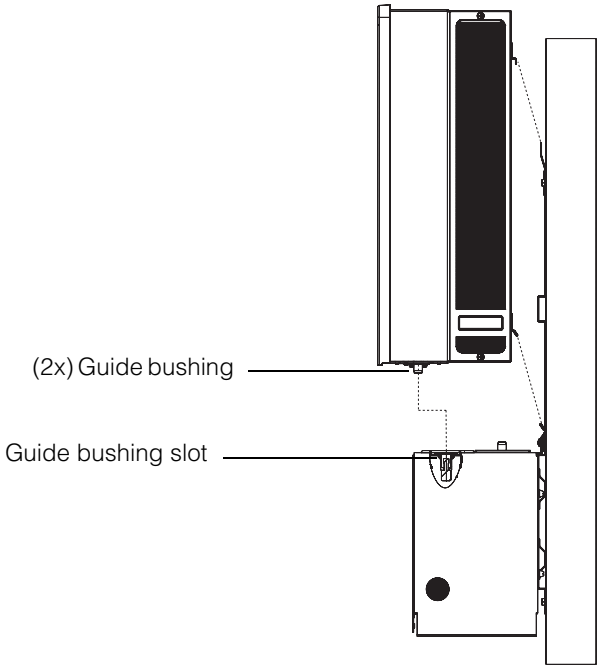

Figure 2-28 Inverter assembly- side view

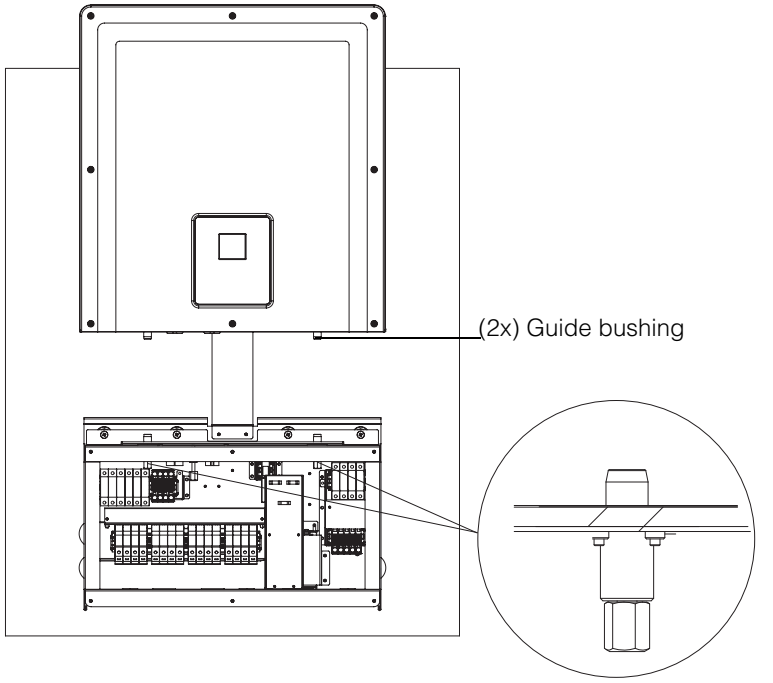

Figure 2-29 Inverter assembly- front view

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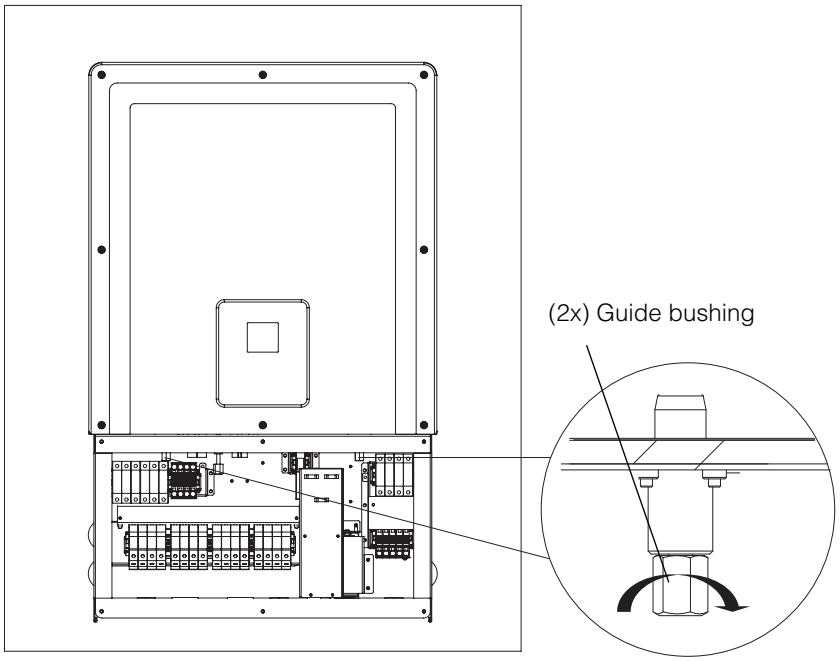

Figure 2-30 Locking the inverter to the wiring box

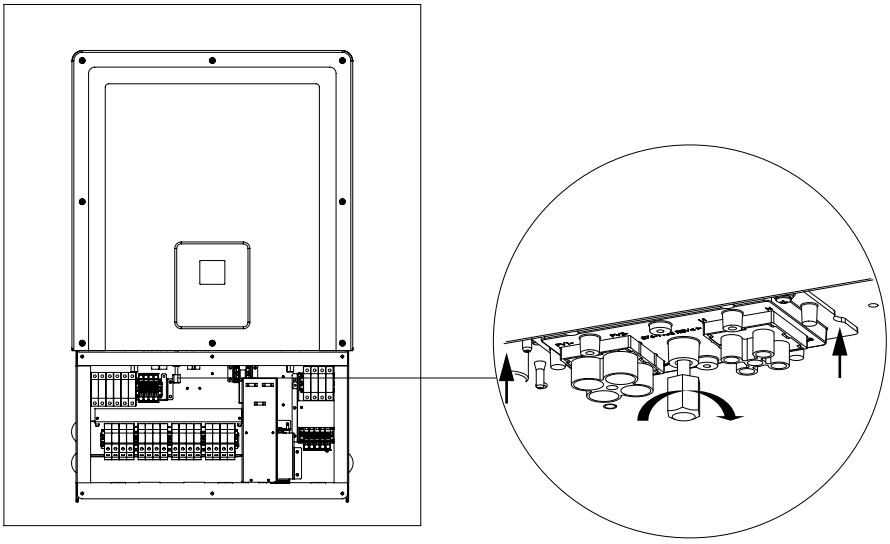

Figure 2-31 Locking Inverter and Wiring box power connector

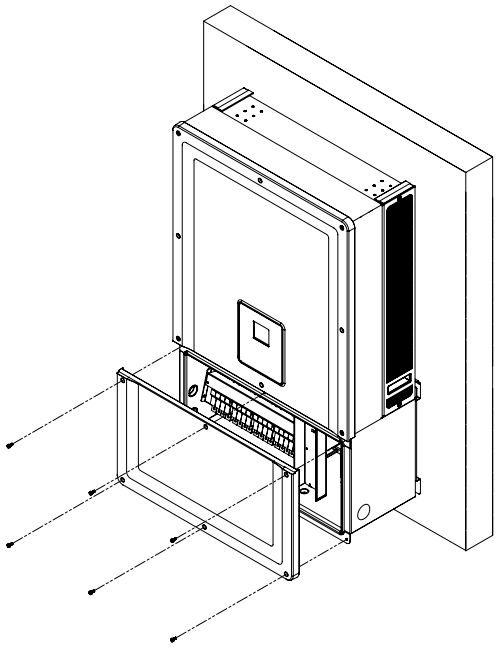

Figure 2-32 Closing the wiring box

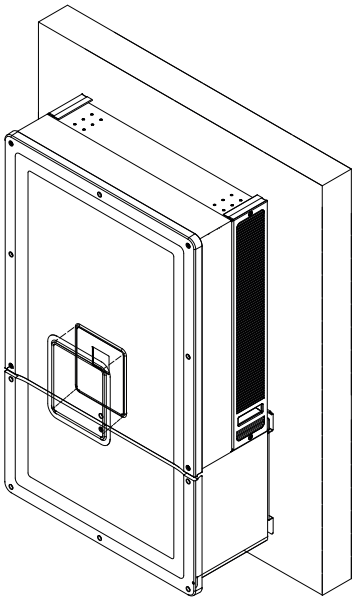

Figure 2-33 Affixing the silicone layer

Planning and Wiring

This section describes the PV Planning, DC Wiring to the inverter, and AC grid connection Planning and Wiring.

⚠⚠ DANGER

HAZARD OF ELECTRIC SHOCK AND FIRE

- All the electrical work must be done in accordance with the local electrical codes.
- The Conext CL inverter has no user serviceable parts inside. To be installed and serviced only by qualified personnel equipped with appropriate PPE and following safe electrical work practices.
- Before installation, de-energize the AC and PV sources using external disconnecting means provided in the installation.
- Test using a meter rated at least 600 VAC and 1000 VDC to make sure all the circuits are de-energized. Follow a lock-out tag-out procedure.
- Connect the PV conductors, only after earthing the inverter through the AC connection and the earthing terminal.

Failure to follow these instructions will result in death or serious injury.

Recommended Protection Devices and Conductor Sizing

⚠CAUTION

HAZARD OF FIRE

- To reduce the risk of fire, connect the inverter only to a circuit provided with 39A maximum branch circuit overcurrent protection in accordance with the National Electrical Code, ANSI/NFPA 70.
- The inverter shall be connected only to a dedicated branch circuit.

Failure to follow these instructions can result in moderate or serious injury.

It is the responsibility of the installer to determine and provide the external over current protection and disconnecting means if required, in addition to the integrated features for the PV input wiring. Determine the need for over current protection, and its rating or setting, based on the:

- Applicable installation codes, as per ANSI/NFPA 70 or the Canadian Electrical Code® CSA C22.1 wiring methods and section 690.35 section for installation.
- Array currents involved
- Current ratings (see “Specifications” on page A–1)
- Expected ambient temperatures

- Any other system parameters required by the installation codes.

Planning

This section provides information about the PV planning.

PV Planning

⚠⚠ DANGER

HAZARD OF ELECTRIC SHOCK, FIRE AND EQUIPMENT DAMAGE

Use this inverter only with PV modules that have a UL Class A rating.

Failure to follow these instructions will result in death or serious injury.

NOTICE

RISK OF EQUIPMENT DAMAGE

- Do not ground either the positive or negative conductor from the PV array.
- The maximum power of an array connected to each MPPT must not exceed 11400 W (for the Conext CL 18000NA inverter) or 15900 W (for the Conext CL 25000NA inverter).

Failure to follow these instructions can result in equipment damage.

⚠WARNING

HAZARD OF ELECTRIC SHOCK, FIRE, AND EQUIPMENT DAMAGE

- The PV array voltage must never exceed 1000 VOC (open circuit voltage) under any condition.
- The DC conductors of this photovoltaic system are ungrounded and may be energized.
- The Absolute Maximum PV array I_{SC} (short circuit current) must not exceed the specified limit per MPPT under any conditions.

Failure to follow these instructions can result in death or serious injury, and equipment damage.

The Conext CL must be used only with ungrounded/ floating connections, wherein the positive and negative terminals of PV array are not grounded. The inverter design is compatible with Mono Crystalline or PolyCrystalline panel.

A PV Array Sizing tool is available for download at http://solar.schneider-electric.com/product/conext-designer/ and select additional links to access the sizing tool. This software is an optional tool to help PV string design to the rated power capacity of the inverter.

Ensure that the following requirement is met for installation:

- All the components installed between the PV array and the inverter shall be rated for at least 1000 VDC and as per the applicable installation codes.

Table 2-9 PV input parameters

Parameter	Conext CL 18000NA	Conext CL 25000NA
Maximum input voltage, open circuit	1000 VDC	1000 VDC
Maximum input current per MPPT	32 A	26.5 A
Absolute maximum short circuit current per MPPT	36 A	36 A
MPPT full power range	300 - 800 V	500 - 800 V

Note: For more details, refer to the “System Specifications” on page A–2.

Any cable or wiring located outdoors must be outdoor rated, UV (sunlight) resistant with suitable voltage and flammability rating, and should comply with the local code requirements.

NOTICE

RISK OF EQUIPMENT DAMAGE

To ensure protection class TYPE 4 (electronics)/ TYPE 3R (rear portion), and to protect against penetrating moisture and dirt, close the unused inputs and outputs with the hole plugs provided.

Failure to follow these instructions can result in equipment damage.

PV Wiring Diagrams

The inverter can accept PV input on all the four PV array input terminals on each MPPT. A maximum of four PV string inputs can be connected to each MPPT.

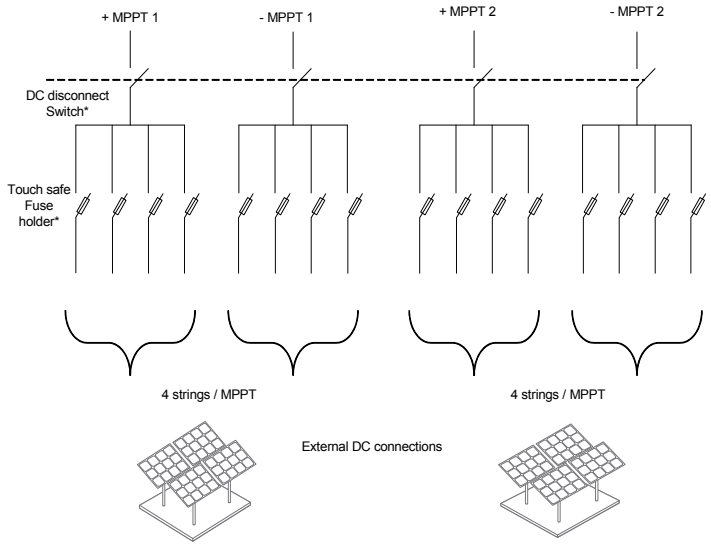

Figure 2-34 PV Wiring diagram of the Conext CL 18000 NA and 25000 NA models

*Not applicable for the base model

Independent or Parallel Configuration of Two Inputs

The Conext CL inverters have dual PV input circuits, each with independent Maximum Power Point Tracking (MPPT) control. The inverter has the flexibility to configure for dual/ single MPPT operation mode. When operated in the dual input mode, the inverter can optimize the operating point of the two independent arrays. Each of the input is dedicated to a separate array with an independent MPPT control. This means that the two arrays can be installed with different orientation.

Dual MPPT Configuration

This configuration is most suitable for PV installations with multi roof orientations and asymmetrical string sizes. The dual MPPT design permits two separate PV input circuits for each MPPT trackers.

Single MPPT Configuration

This configuration is most suitable for PV installation with homogeneous panel orientation and symmetrical string sizes. The single MPPT configuration permits only one PV input circuit. Both the MPPT trackers are wired and operate in parallel.The MPPT parallel option is applicable for all the models. For more information on selecting the MPPT, refer Figure 3-3 on page 3–7.

To operate the inverter in single MPPT mode,

1. Connect the MPPT shorting terminal block by means of a solid copper jumper, (provided with the wiring box accessory kit), to parallel the MPPT trackers.
2. Install the jumpers between the two channels (positive and negative) and ensure for proper slide in connection to avoid arcing.

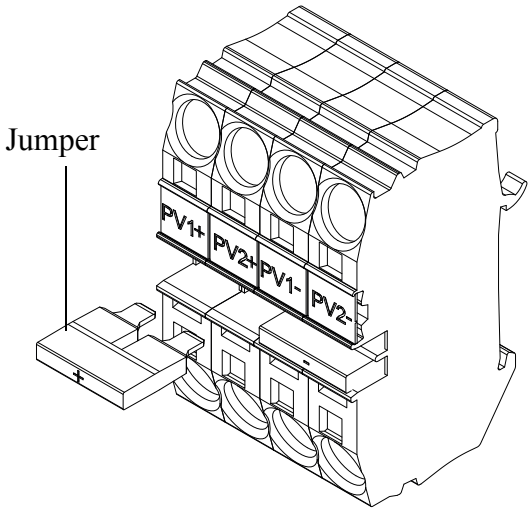

Figure 2-35 MPPT Shorting Connector and Jumper arrangement

PV1(-) and PV2(-): Connect these two terminal blocks with a jumper to parallel the NEGATIVE MPPTs.

PV1(+) and PV2(+): Connect these two terminal blocks with a jumper to parallel the POSITIVE MPPTs.

You can change the MPPT configuration anytime later after the First time power up using the Install Settings menu.

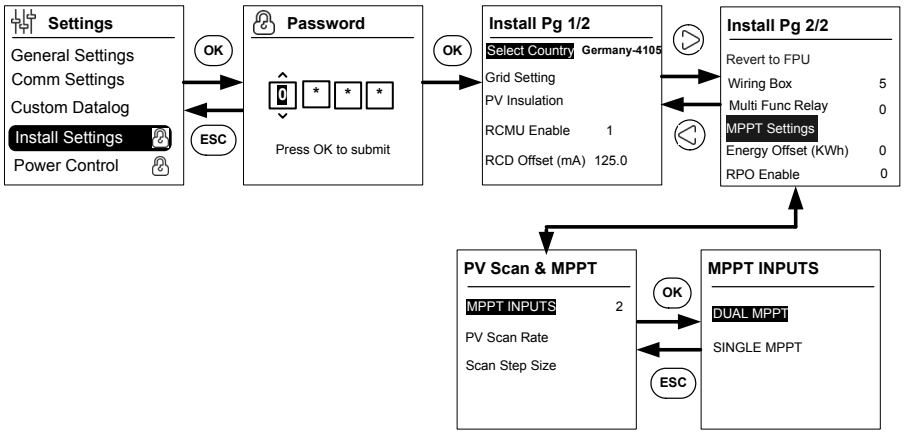

Figure 2-36 MPPT settings through Install settings menu

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DC Wiring (From PV Array)

DC Wiring Polarity

The Conext CL inverter has in-built reverse polarity protection of PV, provided by a diode. The inverter will display error message for any reverse polarity wiring at the DC input. When the array is shorted, there will be no DC voltage on the MPPT input and the PV generator will be in short circuit condition.

NOTICE
RISK OF EQUIPMENT DAMAGE • Ensure that correct polarity is used at all the power connections. • Do not ground either the (+) or the (-) conductor of the PV array. • Avoid reverse polarity. If one of the string polarity is reversed in parallel with other strings, it will cause 2000 VDC across the inverter input. • Ensure proper termination and avoid poor connection. **Failure to follow these instructions can result in equipment damage.**

DC wiring

Before connecting the wires to the wiring box, ensure that the DC disconnect switch is in the OFF position.

The provision for conduit entries are provided at the bottom and at the left side of the wiring box. Select the appropriate conduit entry as per the location convenience. The conduit entries and the DC disconnect switch are as shown in Figure 1-6 on page 1–7.

The conduit size and associated accessories selection should be appropriate to ensure the TYPE 4 environmental protection.

Cable requirements

- Cable type: solid or stranded, copper wire
- Cross section: 10 AWG (5.3 mm^2) to 6 AWG (21.2 mm^2)
- The DC cables must be approved for temperatures over 194° F (+90° C)
- The maximum cable length subject to conductor cross-section must be observed
- The DC cables must be sized in accordance with the installation requirements.

AC Grid Connection Planning

This section describes the requirements regarding the AC output wiring.

The AC cable must be jacketed and has five insulated copper conductors to allow connection to L1, L2, L3, N, and PE (protective earth). Any cable or wiring located outdoors must be outdoor rated and UV (sunlight) resistant.

The AC terminal block provided can accommodate AC cable sizes from 20 AWG to 4 AWG. The recommended AC cable diameter is 8 AWG to 4 AWG. The length of the cable should be selected to limit the voltage drop to <1%.

It is recommended to use twisted wire cables to reduce the grid line inductance and for improved performance. If single core cables are used in the open duct, keep the distance between the cores as minimum as possible.

NOTICE

RISK OF EQUIPMENT DAMAGE

- Ensure that L1, L2, L3, line connections are done correctly, not swapped with neutral connections.
- The Conext CL inverter supports TN-S, TN-C, TN-C-S and TT connection types (earthing systems). It does not support IT connections.

Failure to follow these instructions can result in equipment damage.

AC Wiring

This section describes how to connect the inverter to the AC grid. All the electrical installations must be carried out in accordance with the applicable local standards.
The installer should ensure that the DC input and AC output circuits are isolated from the enclosure and the system grounding.The connection requirements of the grid operator must also be met.
The line voltage must be within the permissible range. (Refer to the “System Specifications” on page A–2.

Cable requirements

- Cable type: solid or stranded, copper wire.
- Cross section: 10 AWG to 4 AWG.
- The AC cables must be approved for temperatures over 194° F (+90° C).
- The maximum cable length subject to conductor cross-section must be observed.
- The AC cables must be sized in accordance with the installation requirements.

Installing the Wire

Stripped solid conductors or stranded conductors with ferrules are easily connected by simply pushing the conductor into the wire entry. For conductors rated 20 AWG (0.5 mm^2) to 6 AWG (16 mm^2) stranded conductors can also be easily inserted without using any tools.

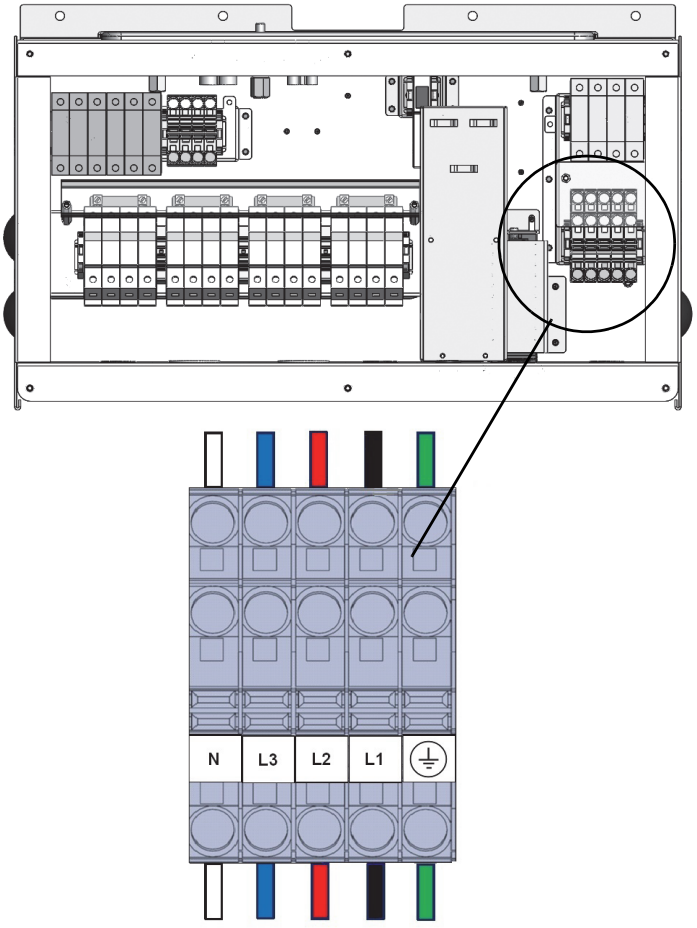

Figure 2-37 Wire installation

For wires with smaller cross-section, use a a small flat screwdriver (1/4” wide) to connect stranded conductors without ferrules. Refer to the figure below.

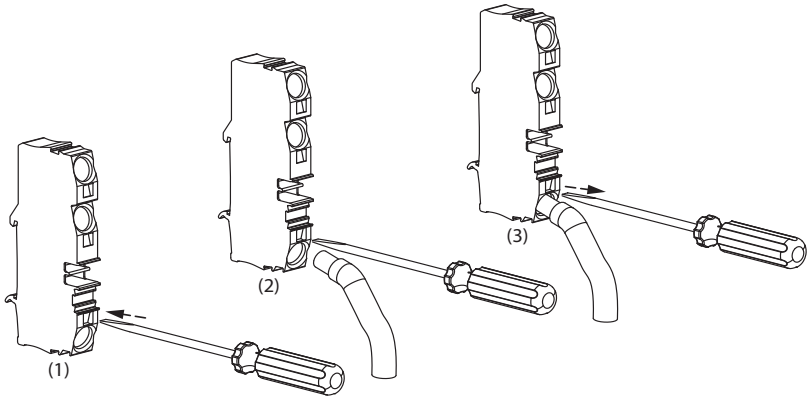

Figure 2-38 Wire installation-2

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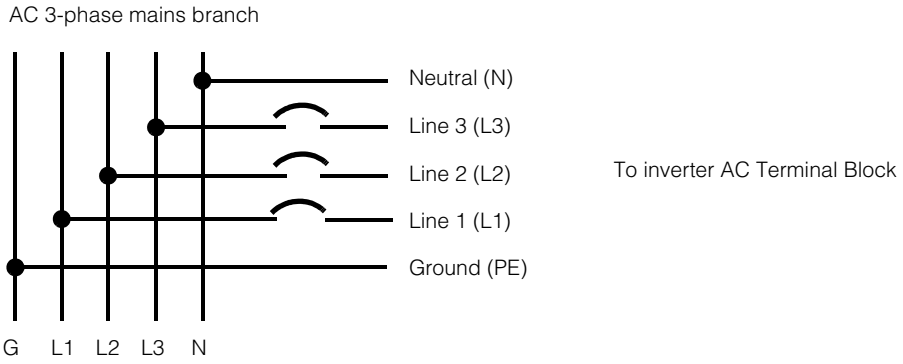

Figure 2-39 AC connection details

Table 2-10 Color-coding to identify the phase sequence (phase rotation)

Component of AC wiring	Color
Line 1 (phase 1)	Black
Line 2 (phase 2)	Red
Line 3 (phase 3)	Blue
Neutral	White
Protective earth ground	Green

NOTICE

RISK OF EQUIPMENT DAMAGE

The inverter supports positive and negative phase sequences. The sequence of L1 ~ L3 can be reversed; N and PE are not bonded together and must be connected to the correct pins regardless of the phase sequence.

Failure to follow these instructions can result in equipment damage.

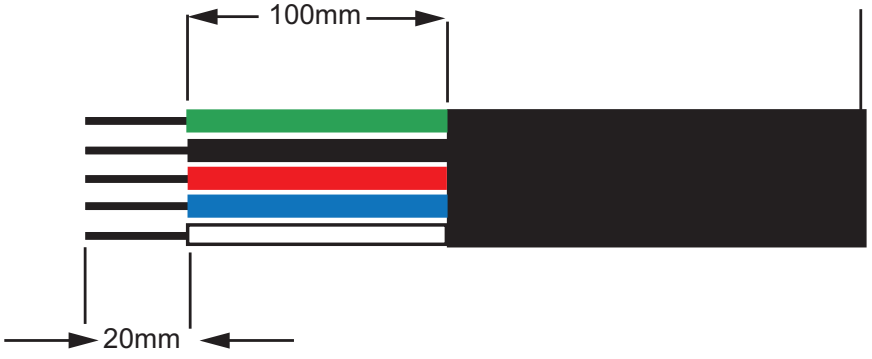

Figure 2-40 AC wiring

This manual is for use by qualified personnel only

- Trim all the wires to 3.94 in (100 mm).
- Using an appropriate tool, strip 0.79 in (20 mm) of insulation from all wire ends.
- Insert the stripped end of each of the five wires into the appropriate hole in the female insert.

Maximum AC Cable Length

The following table provides recommended maximum cable lengths for 8 AWG, 6AWG and 4AWG conductor size from inverter to AC distribution box.

Table 2-11 AC cable loss details- copper

KVA	Percentage losses (Copper cable)		
18 KVA			
AC cable length	8 AWG	6 AWG	4 AWG
25 m	0.4%	0.22%	0.14%
50 m	0.7%	0.45%	0.28%
75 m	1.1	0.67%	0.42%
100 m	1.4	0.90%	0.56%
25 KVA			
25 m	0.7%	0.42%	0.27%
50 m	1.3%	0.85%	0.53%
75 m	2.0%	1.27%	0.80%
100 m	2.7%	1.69%	1.06%

If the AC cable length exceeds 32.8ft (10 m), the use of an AC distribution box closer to the inverter is recommended.

Table 2-12 AC cable loss details- aluminium

KVA	Percentage losses (Aluminium cable)		
18 KVA			
AC cable length	8 AWG	6 AWG	4 AWG
25 m	0.9%	0.6%	0.3%
50 m	1.8%	1.1%	0.7%
75 m	2.7	1.7%	1%
100 m	-	2.2%	1.4%
25 KVA			
25 m	1.2%	0.8%	0.5%
50 m	2.4%	1.5%	1%
75 m	-	2.3%	1.4%
100 m	-	3%	1.9%

Note: The values mentioned above are only for general reference.

⚠⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, AND ARC FLASH

- Always be cautious of nicked wire insulation.
- Always use the specified cable length while stripping the AC and DC cable.

Failure to follow these instructions will result in death or serious injury.

Earthing Terminal

The use of an earthing terminal depends on the local installation codes. It is recommended to use this terminal for effective earthing means. It can be used to connect the PV metalwork to earth, or to provide a second protective ground connection for the inverter chassis as required by some countries. It is the responsibility of the installer to determine proper use of this terminal.

Note:

- It is recommended to:
  - follow the local installation codes for earthing conductor size selection.
  - use M6 lug for crimping.
- The DC input and AC output circuits are isolated from the enclosure and that system grounding, if required by Sections 690-40 and 690-42 of the National Electric Code, ANSI/NFPA 70, is the responsibility of the installer. Use at least a minimum of 8 AWG (8 mm^2) copper earthing conductor.
- The selected cable should be rated for 194° F (90° C) minimum.

⚠WARNING

HAZARD OF ELECTRIC SHOCK

If the PV metal work grounding is done at the inverter, removal of the inverter from the wiring box or disconnection of the AC plug from the inverter will leave the PV metal work ungrounded; in these cases provide suitable temporary additional grounding.

Failure to follow these instructions can result in death or serious injury.

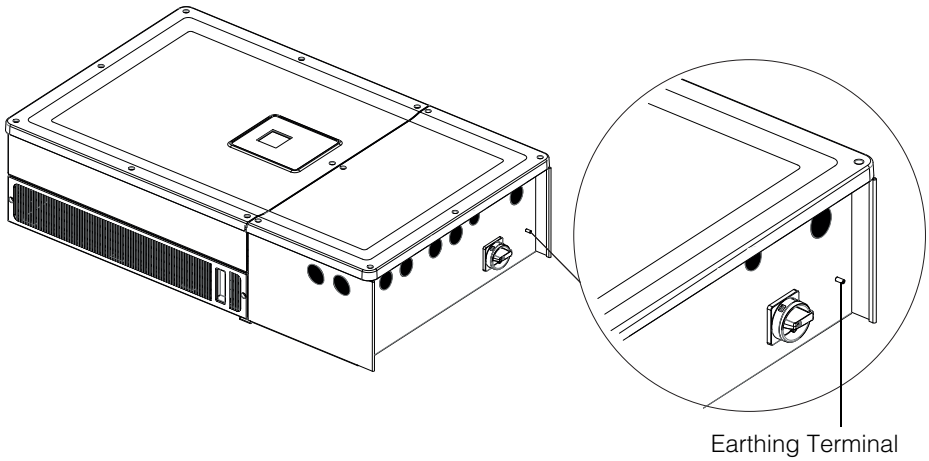

Figure 2-41 Connecting the earthing conductor

Communication Interface

The communication interface wires are of Safety Extra Low Voltage (SELV) type circuits.The Conext CL supports multiple communication interfaces such as Modbus, Ethernet and USB Host services. In addition, the inverter supports RPO (Remote Power Off) and Dry contact relay.

⚠WARNING

HAZARD OF ELECTRIC SHOCK

- Connect only to Safety Extra Low Voltage (SELV) circuits.
- The circuits provided for external communications and control equipment are designed to provide isolation from the neighbouring hazardous circuits within the inverter. The communications and control circuits are classified as Safety Extra Low Voltage (SELV) and must only be connected to other SELV circuits of the types described in this manual.
- Maintain physical and electrical separation of the communications and control circuits from non-Safety Extra Low Voltage (SELV) electrical circuits, both within and outside the inverter.

Failure to follow these instructions can result in death or serious injury.

The below diagram shows the front view of the communication interface.

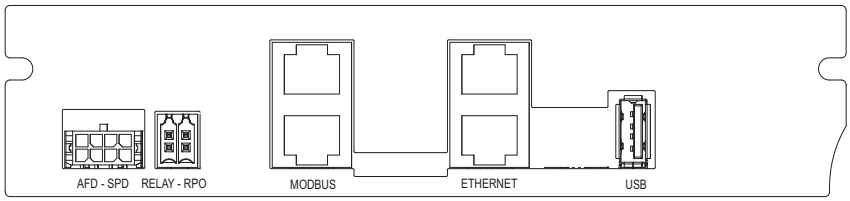

Figure 2-42 Communication interface

Connecting Cables to the Communication Module

To access the communication ports, remove the communication hole plugs. Refer to the Figure 1-3 on page 1–5 for the location of the communication cable.

The connections for the Modbus, Ethernet, RPO and Dry Contact Relay are done through an appropriate conduit connector. The conductor protection should be in-line with the applicable wiring codes.

- For non conduit installations, the cables can be brought into wiring box via a 3/4” box connector with plastic or metal cable glands (UL approved). To maintain TYPE 4X rating, ensure that proper glands are used.
- For conduit use, applicable raceway needs to be placed and termination is done at the wiring box chassis, using conduit connectors appropriate for the raceway. The conduit must be terminated at the 3/4” opening.

The RPO and dry contact relay cables can be connected to the communication card using the mating connectors provided along with the wiring box lit kit. Refer to the Table 2-1 on page 2–3.

SPD- AFD monitoring cable connection

The SPD- AFD monitoring cable to be connected to communication card as shown in Figure 2-44 on page 2–46.

1. Check for the SPD- AFD monitoring cable at the cable tray end.

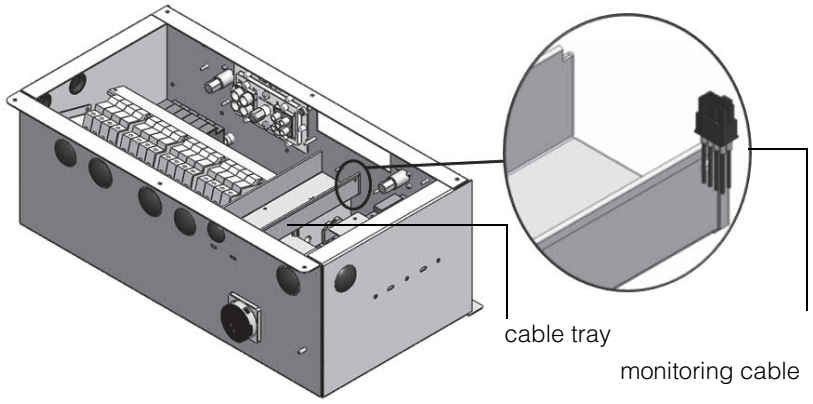

Figure 2-43 SPD- AFD monitoring cable

2. Cut the cable tie to separate the monitoring cable.
3. Remove the ESD cover over the connector.
4. Connect the SPD- AFD monitoring cable to the Comm card.

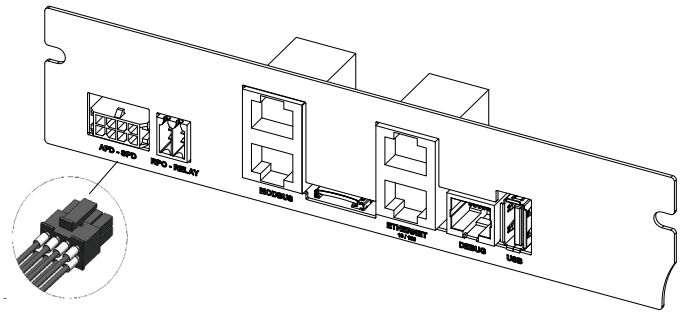

Figure 2-44 SPD- AFD monitoring cable connection

Note:

- The monitoring cable connection to Comm card remains the same for PVSCL1825NA201, PVSCL1825NA300 and PVSCL1825NA301.
- The SPD- AFD connector will not be present in PVSCL1825NA100 and PVSCL1825NA200.

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Modbus RS485 Connection

The pin definitions of the Modbus (RJ-45) connection are shown in Table 2-13. Figure 2-45 on page 2–47 shows the RJ-45 connectors.

> ***NOTICE***
>
> **RISK OF EQUIPMENT DAMAGE**
>
> Make sure the other end of the Modbus (RS485) connection is also Modbus (RS485). Connection to any other type of communication port, such as Ethernet, may result in an equipment damage.
>
> **Failure to follow these instructions can result in equipment damage.**

Note:

- Using incorrect pin out for RS-485 cable and interchanging the GND pins, results in discontinuity on the network and poor communication.
- It is recommended to use the shielded Cat5 cable 24 AWG.

Table 2-13 RJ-45 pin details

Pin	Function
4	DATA+
5	DATA-
7	NC (Not connected)
8	Modbus ground

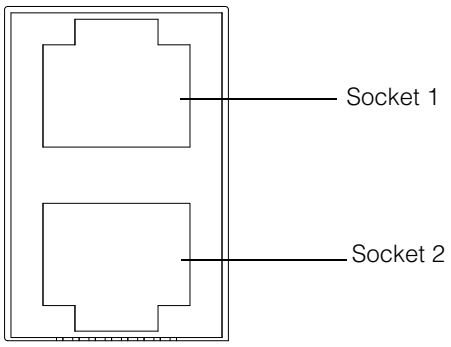

Figure 2-45 Modbus (RS485) connectors

The data format for the RS485 connection is shown in Table 2-14.

Table 2-14 Data format for the RS485 connection

Parameter	Value
Baud rate	9600 (default),19200, 38400, 57600, 115200
Data bits	8
Stop bits	1 (default)
Parity	None (default), Odd, Even

Ethernet Connection

The Conext CL supports Ethernet communication in star network configurations. By default, the DHCP setting is zero. For network communication, enable the DHCP setting.

Home> Settings> Comm Settings> Network Settings

Ensure to connect the Ethernet cable only to socket1 as shown below:

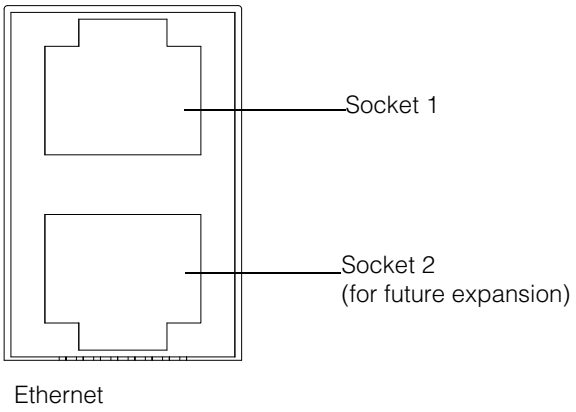

Figure 2-46 Ethernet Connection

Daisy Chain Configuration

In a single unit configuration, only one RJ45 connection is used and the end terminator plug (Modbus Terminator) provided with the wiring box packaging is connected into the other RJ45 connector as shown in Figure 2-47.

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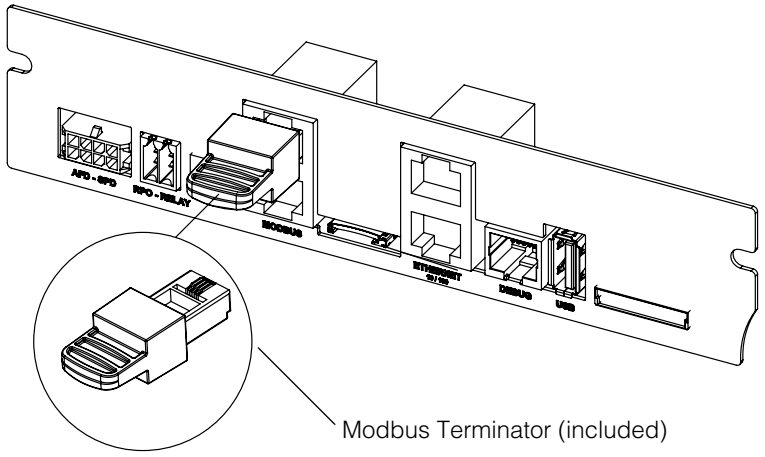

Figure 2-47 Daisy chain configuration

The Conext CL inverters can be connected in Daisy chain configuration. In this case both RJ45 connections are used except either on the first or the last units in the network. The end terminator plug for the first or last unit should be connected on the RJ45 connector as shown in Figure 2-47. A maximum of 32 inverters can be daisy chained.

Note: Ensure to use a Modbus Terminator in one of the inverters connected in the network, for proper communication.

For multiple inverter connection, refer to the Figure 2-48.

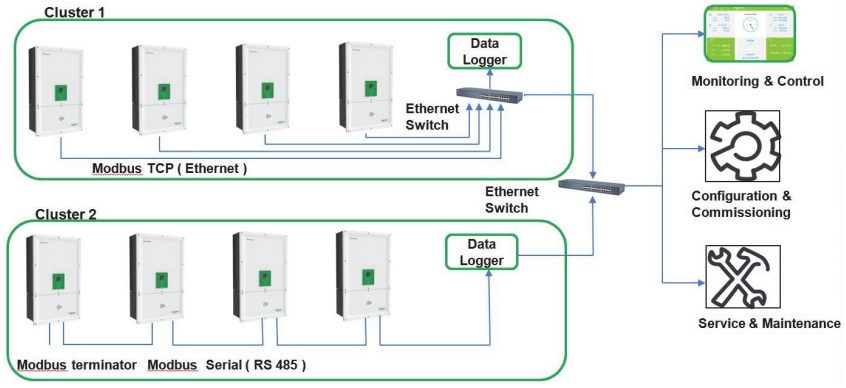

Figure 2-48 Cluster 1: Modbus TCP and Cluster 2: Modbus RS485 connections

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RPO and Dry contact relay connection

⚠WARNING

HAZARD OF SHOCK AND RISK OF EQUIPMENT DAMAGE

- Do not connect circuits exceeding 28 VDC and 3 A to the dry contact output. The use of a 3 A/32 VDC certified fuse is recommended.
- Do not interchange the RPO and Dry Contact.
- Enabling the RPO will not isolate the inverter from PV and grid sources. It is required to de-energize all the connected sources manually.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

One set of dry contact relay and RPO connectors are provided along with the wiring box packaging.

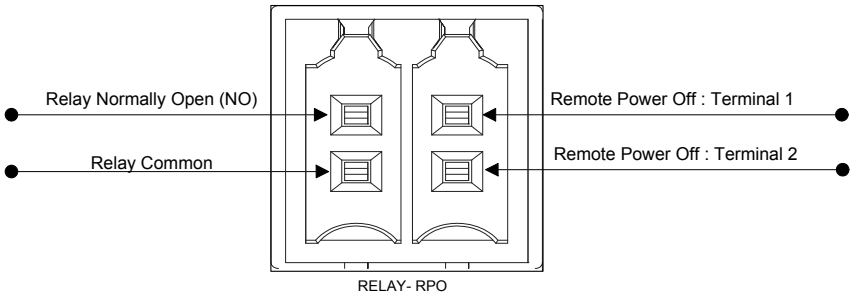

Figure 2-49 RPO and Relay Contact terminal details

Dry Contact Relay

When the inverter is operating under normal conditions, the dry contact is open.The display keypad can be used to configure the relay to operate when events occur. The configurable events are:

- Relay enabled on any inverter event.
- Relay enabled on any one of user set inverter event (Max of three event code).
- Relay enabled on inverter temperature set limit.
- Relay enabled based on inverter power level set limit
- Relay enabled based on inverter status (online/offline).

Refer to the Figure 2-50 for typical connection. A maximum of 28 VDC supply can be connected in series with the relay terminals. It is also recommended to use a wire size of 18 AWG for relay wiring, and a suitable external fuse (<3 A) for additional protection.

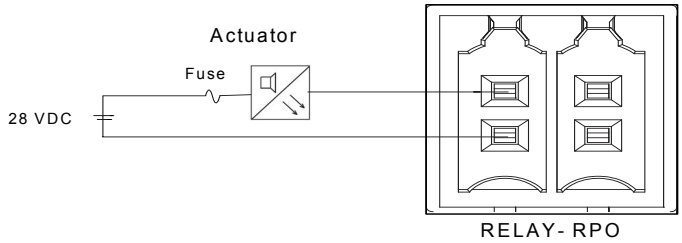

Figure 2-50 Dry Contact Relay connection

Remote Power Off

The remote power off terminals (potential free contact) can be used to turn off the inverter from a far distance with in the site. By default, the RPO option is disabled.This feature is operational, only when the inverter is online and the RPO enable option is configured. The RPO terminals should be connected to a switch which has a normally closed (NC) contact. The inverter can be turned off by opening the contact. The maximum permissible distance for RPO switch from the inverter location should be limited to 30 m. The recommended wire size for RPO switch wiring is 22 AWG, 2 wires.

- The inverter will not turn ON if the RPO terminals are not wired properly (Normally Closed (NC) configuration) and the RPO enable option is configured from the LCD Settings menu.

  Home> Settings> Install Settings.
- Ensure that there is no break in the RPO terminals.

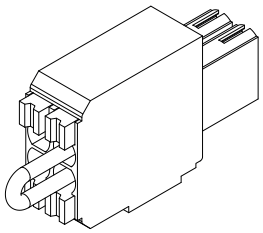

Figure 2-51 RPO connection with shorting link

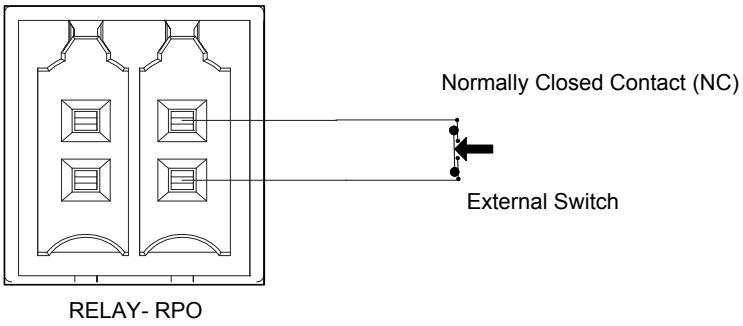

Figure 2-52 RPO connection for single inverter

The connection diagram for RPO with multiple inverters is as shown below.

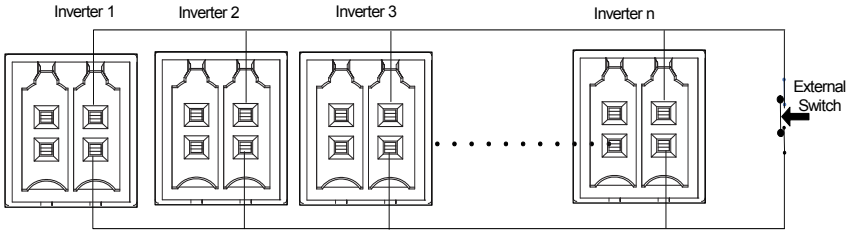

Figure 2-53 RPO connection with multiple inverters

PV String Protection

NOTICE
RISK OF EQUIPMENT DAMAGE It is required to use only gPV class fuses for protecting PV array from short circuit current as per UL 2579. The selection of appropriate fuse rating is very important for any given PV installation. **Failure to follow these instructions can result in equipment damage.**

For calculating the PV fuse rating for a specific PV array installation, refer to the PV panel manufacturer documentation and NEC 690.8 and 690.9 in addition to local electrical installation code.

If less than 2x strings are used per MPPT, fusing may not be needed, dummy link can be used.

Recommended Fuse: Part number: PV-15A10F
Make: Cooper Bussman
Rating:1000 VDC, 15 A.

Schneider order code: OJ-512-0073-Z (set of 20 fuses)

Recommended dummy link part number: C10NL
Make: Cooper Bussman
Schneider order code: OJ-512-1028-Z (set of 10 links)
Note: Not applicable for Base model.

Arc Fault Detection

The Conext CL has an external arc fault detection unit integrated in the wiring box as shown in Figure 2-55. The AFD unit is powered internally from the inverter. The digital output from the AFD unit is connected to the communication interface. In the event of an Arc fault in the PV system, the AFD detects the Arc Fault, the inverter will stop producing output power and AC output relay will be opened.

The arc fault status is stored in the memory and will remain active until reset manually by an operator.

Every time the inverter starts, a self test happens. At any time of operation, the user can initiate an AFD self test via LCD, to check the healthiness of the AFD device. For more details, refer, “AFD Fault” on page 5–10.

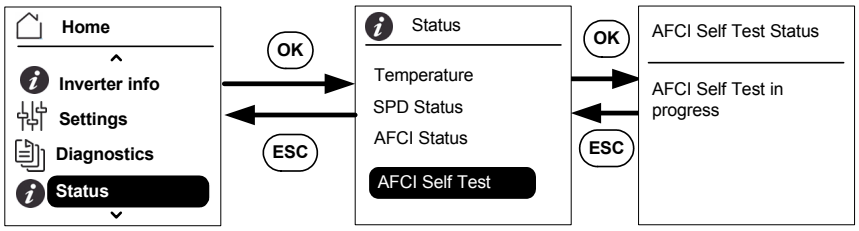

Figure 2-54 AFCI menu structure

A tripped AFD can be reset only manually.

Note: In accordance with NEC, Article 690.11, the inverter has a Type 1 photovoltaic AFD. The AFD is an optional feature. For more details, refer to the “Wiring Box Configurations” on page 2–14.

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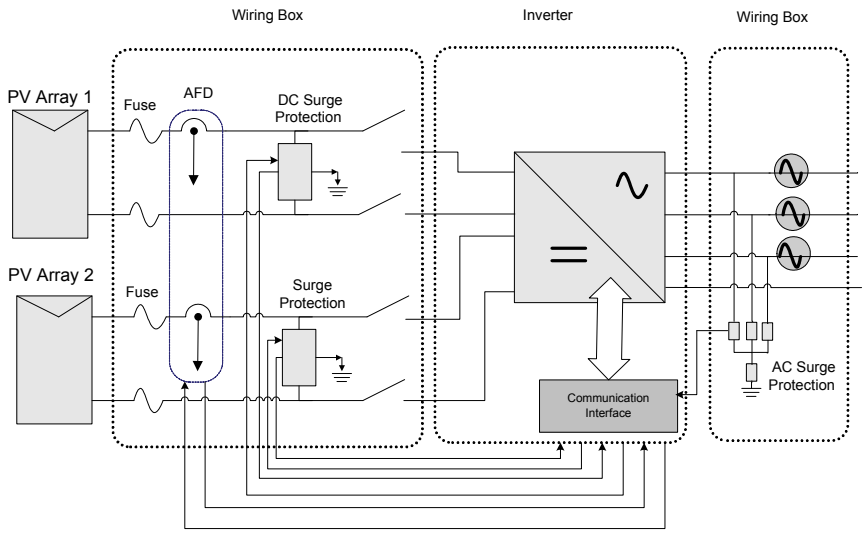

Figure 2-55 Arc Fault Detection and Surge Protection device wiring

Surge Protection Device Monitoring

Overvoltage surge arrestors are provided on the DC and AC side for protecting the inverter from high voltage surges due to any abnormal conditions.
Figure 2-55 shows the connection details for both AC and DC SPD's. The Conext CL has SPD monitoring feature, that indicates the End of Life and need for the SPD module replacement.

Note: SPD is an optional feature. For more details, refer to the “Wiring Box Configurations” on page 2–14.

Web Interface

The Conext CL inverter has an integrated built in web server. The user can access the inverter data using an Ethernet network connection. The following steps explain how to access the web module of inverter.

1. Connect one end of the Ethernet Cable to the RJ45 Ethernet port (socket 1) on the inverter.
2. Connect the other end of the Ethernet cable to the network router or laptop/ PC.
3. Check the IP address on the LCD display.
4. Note down the IP address of the inverter by navigating through the LCD display.

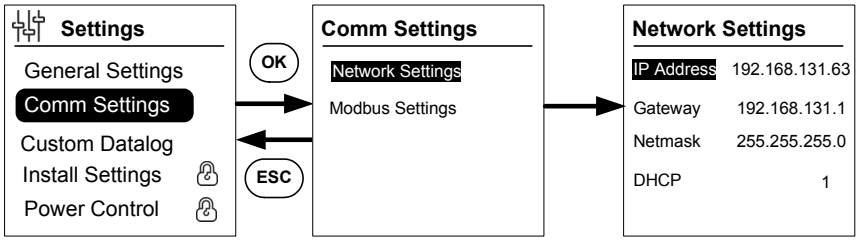

Figure 2-56 Checking the IP address

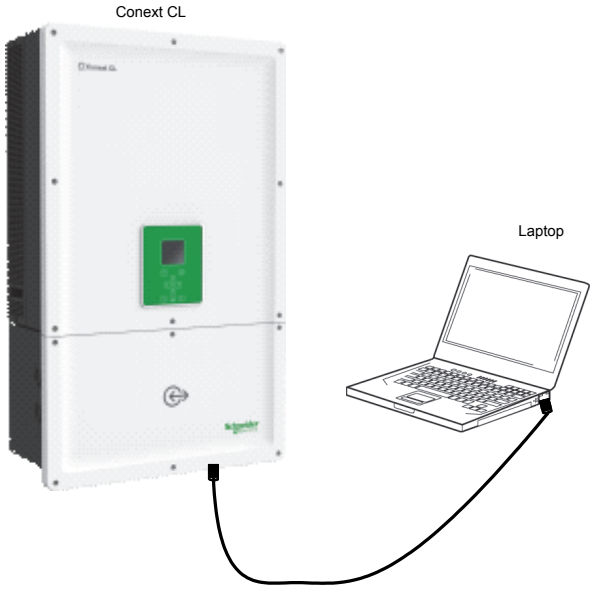

Figure 2-57 Web interface connection diagram

5. Open a web browser on your laptop or tablet and type the IP address displayed on the LCD display. The web browser now loads and displays the Conext CL login web page.
6. In the login page, select the preferred language.
7. Login using the user name and password.
   - The default user name is ‘owner’
   - The default password is ‘conextcl’

On successful login, the Conext CL dashboard is displayed as shown below.

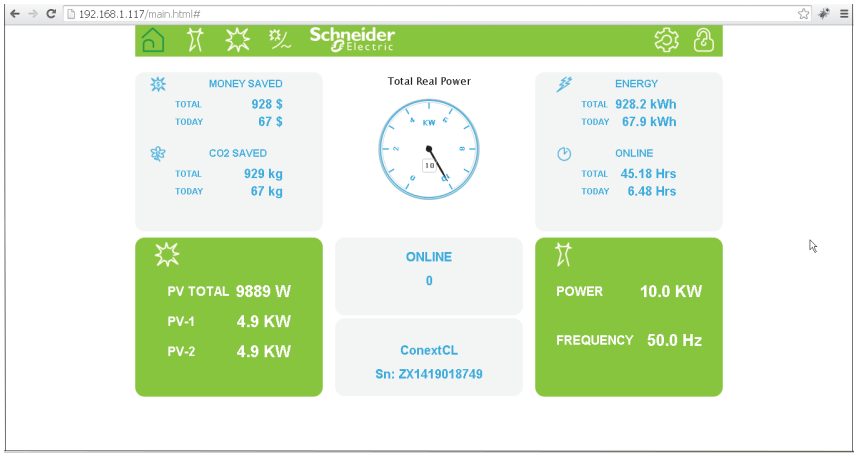

Figure 2-58 Web interface dashboard screen

Internal Data Logger

The Conext CL has an integrated data logger built-in. The logging frequency and size can be configured using the “Menu Structure” on page 3–10.

Table 2-15 Internal Data Logger specifications

Recording Cycle	Storage Time
1 record/5 minute	1 day
1 record/15 minutes	1 month
1 record/1 day	1 year
1 record/1 month	10 years

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3 Operation

Chapter 3, “Operation” contains information on the basic operation of the inverter and the wiring box.

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Commissioning

Start up procedure:

1. Ensure that the DC and AC breaker are turned OFF.
2. Complete the wiring as described in chapter 2.
   - AC wiring
   - DC wiring
   - Earthing
   - Communication Interface
3. Check the polarity of the DC wires and ensure that the maximum DC voltage is not more than 1000 V.
4. Ensure to place the string protection fuses. (Refer to the “PV String Protection” on page 2–53).
5. Ensure proper insertion of communication interface cables to the appropriate connectors.
6. Ensure the dry contact and RPO connections are wired properly.
7. Ensure all the conduit entry provisions are sealed properly after completing the terminations.
8. Replace the cover on the wiring box.
9. Turn ON the AC breaker (external) and ensure that the grid is connected to the inverter. The inverter will boot up and complete the Power on Self test. If the LCD displays any event message, refer to the “Troubleshooting” on page 4–1.
10. On successful completion of the Power on Self test, follow the first time power up settings as described in “First Time Power Up” on page 3–6.
11. After first time power up, turn ON the DC disconnect switch. For the switch location, refer to the Figure 1-3.

If there is sufficient sunlight, the inverter will start producing power.

12. Check the status of the indicator light (LED; refer to the Table 3-1 on page 3–4). The PV status LED should be green.
13. If the PV status LED is not green, check whether:
    - All the connections are correct.
    - All the external disconnect switches are closed.
    - The DC disconnect switch* on the inverter is in the “ON” position.

*The DC disconnect switch is not part of the Base model.

For more details on Configuration settings, refer to the Appendix B, “Descriptions of LCD Information”.

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LCD and Control Panel

The inverter has an LCD control panel, as shown in Figure 3-1. The location is shown in Figure 1-4 on page 1–5.

- To navigate across the LCD menus, use the five navigation buttons shown below in Figure 3-1 on page 3–3.
- To view the Main menu, press the Home button.
- To escape from any of the sub menus to the main menu, press the ESC button.

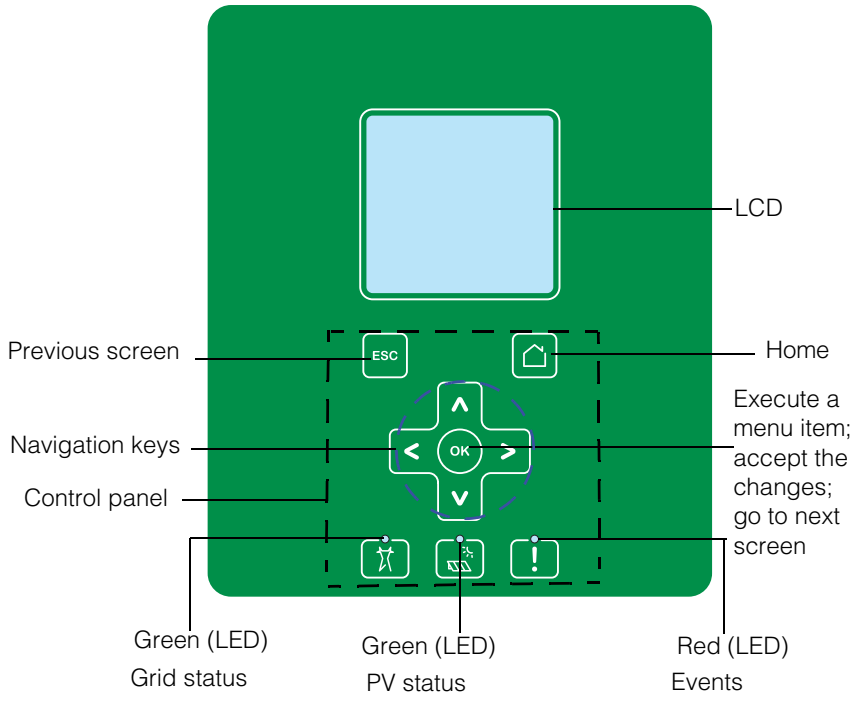

Figure 3-1 LCD Control Panel

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LED Indicators

Table 3-1 LED indicators

LED	Description
Event (red)	ON: an active service condition OFF: no service condition Blink: • Slow Blink: Warning • Fast Blink: RPO is open Note: • Slow Blink: one per second • Fast Blink: five per second
PV On (green)	ON: input PV voltage available OFF: input PV voltage not available Fast Blink: the unit is de-rating due to PV side conditions
AC On (green)	ON: the unit is connected to the grid and power is available. OFF: the unit is not connected to the grid or grid power is not present. Blink: • Slow Blink: the unit is trying to reconnect to grid • Fast Blink: the unit is de-rating due to AC side conditions.

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Table 3-2 Buttons below the LCD

Button	Result
	Go to the home screen
ESC	Go to the previous screen
^	Go to the previous item in a main menu or to the previous screen (in a series of screens)
v	Go to the next item in a main menu or to the next screen (in a series of screens)
<	Go to the previous submenu item/ screen in the main menu
>	Go to the next submenu item/ screen in the main menu
OK	Execute the selected menu item, accept the changes, or go to the next screen (in a series of screens).

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Navigating the LCD Menus and Screens

First Time Power Up

During first time power up, the screen shows the Schneider Electric logo and a progress bar indicating the power up progress.

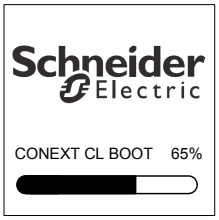

Figure 3-2 Progress bar

1. To operate the inverter for the first time, setup the following quick configuration settings:
   - Language
   - Country selection
   - Time zone
   - Date/time
   - Wiring box selection
   - MPPT selection
   - Modbus selection
2. To set the Country and Wiring box selection, enter the access password. Password: '1234'.
3. The system reboots after the settings are completed. On subsequent startups the inverter will follow the 'Normal Power Up' sequence.

Note:

- Without completing the Country and Wiring box selection, the first time power up will not progress further.
- In case of any wrong settings or selection, the user can restore the factory default settings from the Settings- Install Settings menu. By loading the factory default settings, the inverter restores the default values. Then repeat the first time power up procedure.

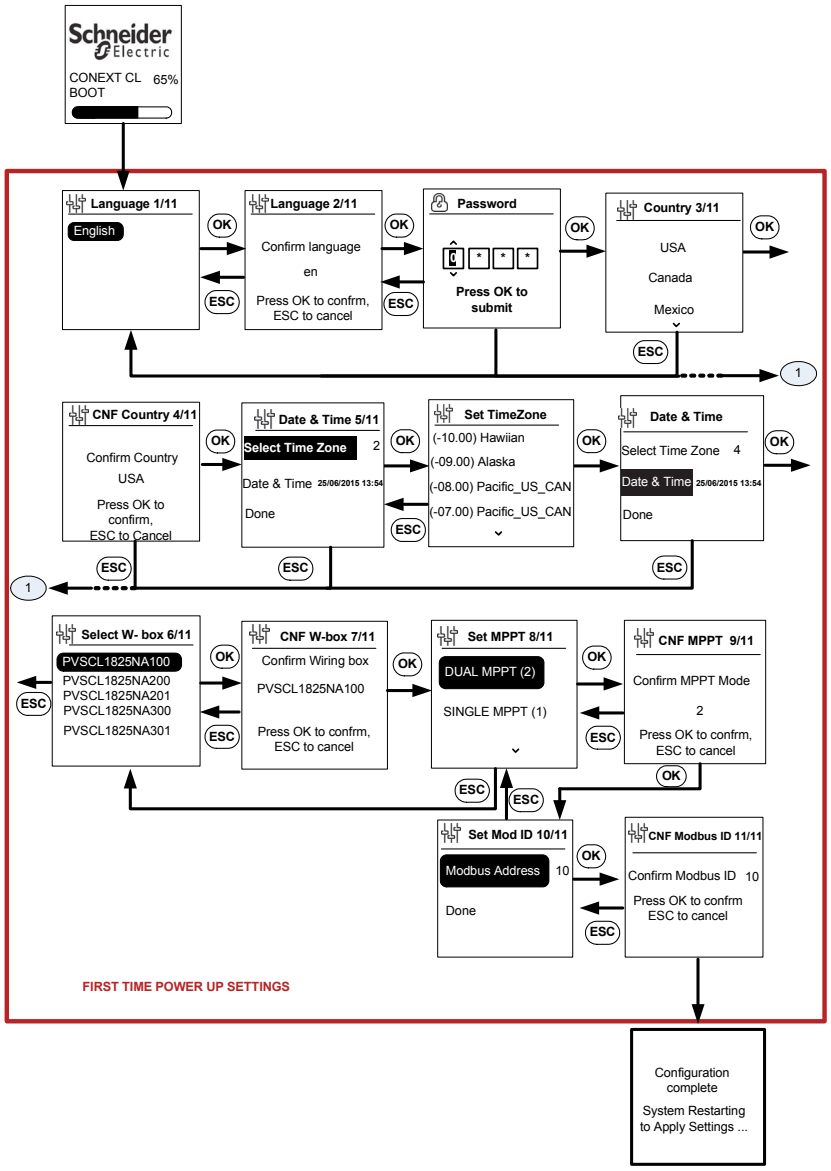

Figure 3-3 First time power up screen

NOTICE

RISK OF EQUIPMENT DAMAGE

The wiring box selection in the LCD Menu Settings should match with the part number on the wiring box label.

Failure to follow these instructions can result in equipment damage.

When the inverter starts running, the home page displays a daily overview of the energy produced.

Menu Settings

There are a series of settings screens for configuring the inverter.

Settings screens for configuring the inverter

1. To select an item to edit, in the Settings screen, use the up/down keypad buttons. The selected item is highlighted.

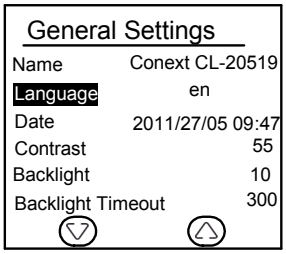

Figure 3-4 General Settings screen1

2. To edit the selected item, press the OK button.The first digit (or character) to edit is highlighted.

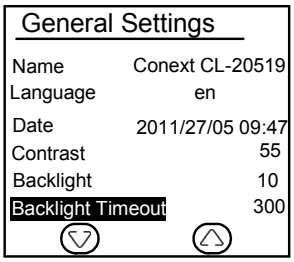

Figure 3-5 General Settings screen 2

- To increase/ decrease the highlighted value, press the up/down (∨ / ∧) arrows. Press left/right keypad buttons to move the cursor in the left/right direction.
- To write the new value in the configuration, press the OK button.
- To cancel the editing, press the ESC button.

Normal Power up

During normal power up, the screen shows the Schneider Electric logo and a progress bar indicating the power up progress. The inverter will boot up and complete the power on self test routine. On successful completion of normal power up, the LCD screen displays a daily overview of energy produced (Quick view).

Quick view

The home page now displays the:

- Energy harvested today
- Status of the inverter (for example, “On Grid”)
- Today’s power curve

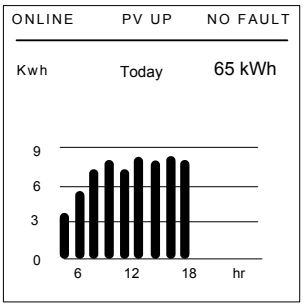

Figure 3-6 Quick view

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Menu Structure

The following Figure 3-7 to Figure 3-12 shows the menu structure and navigation flow for accessing the different inverter settings and logs.

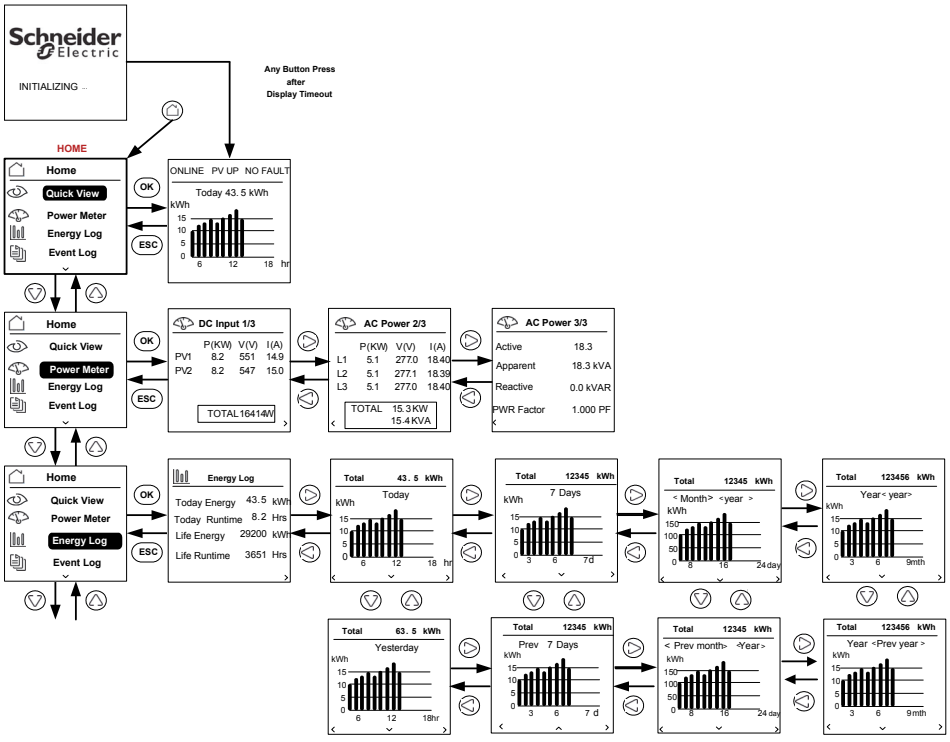

Figure 3-7 Menu structure -1

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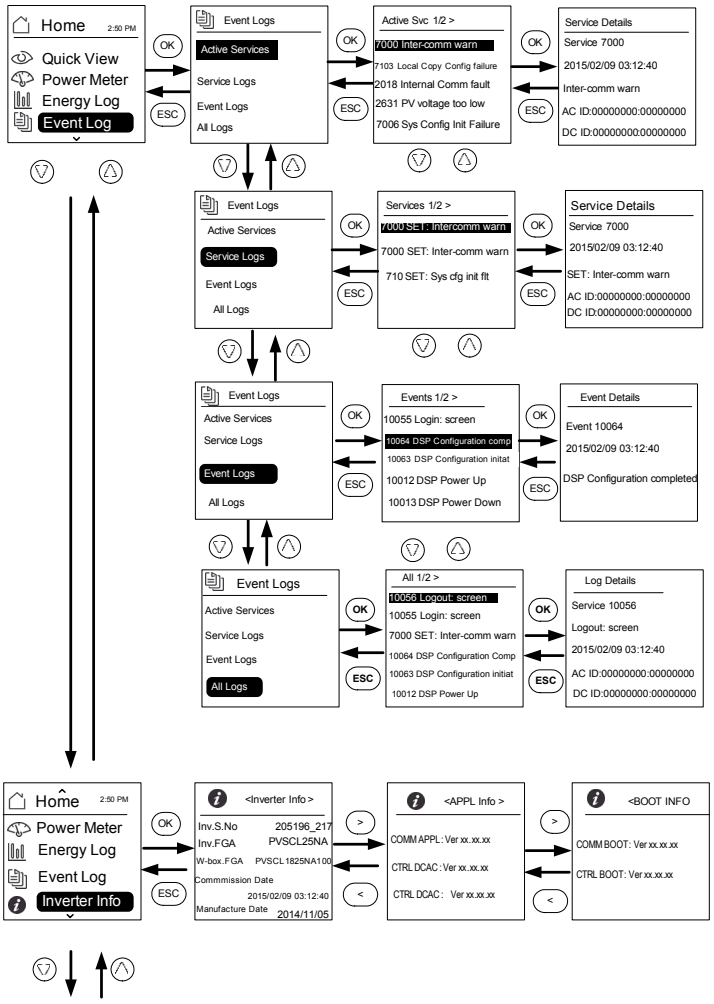

Figure 3-8 Menu structure- 2

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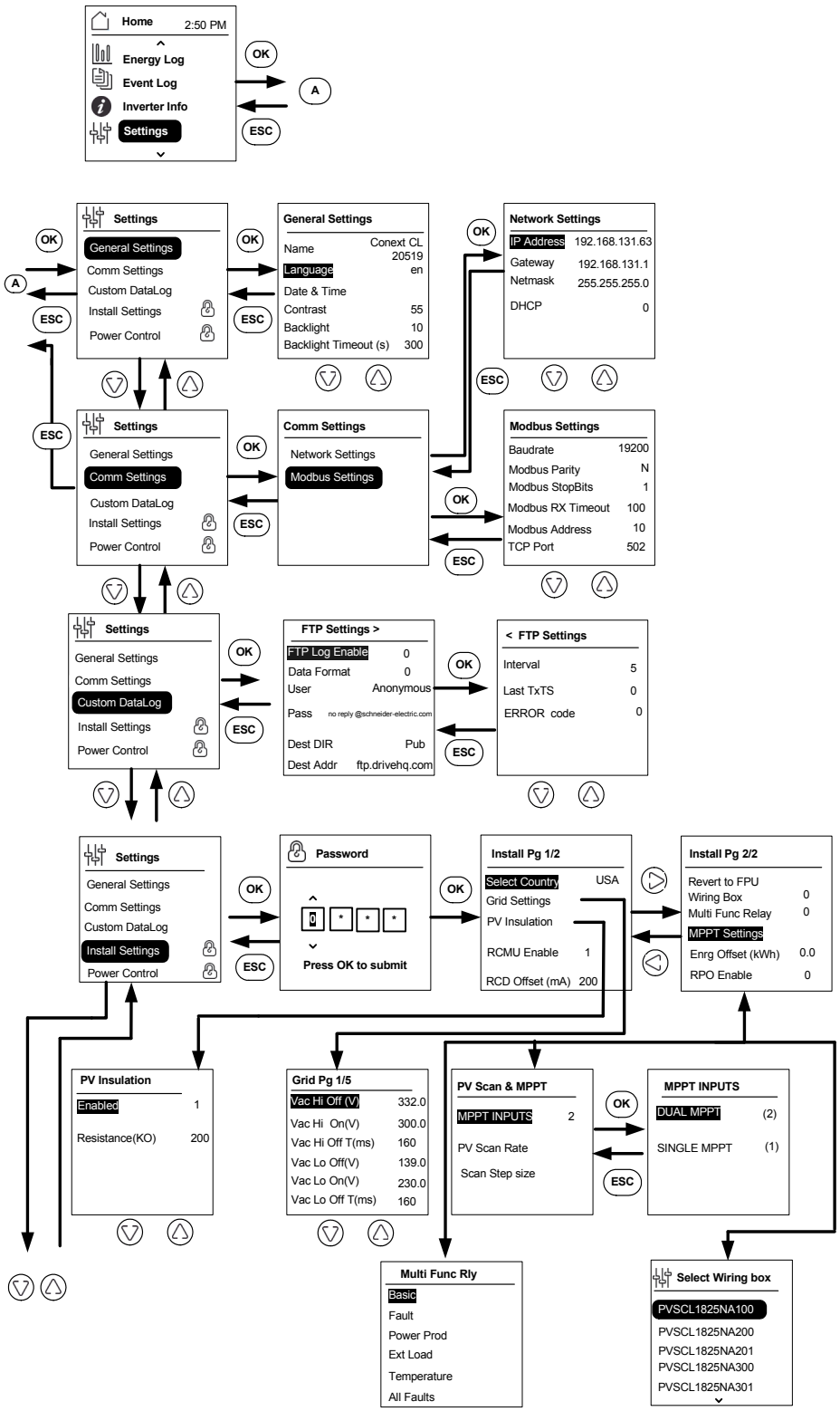

Figure 3-9 Menu structure -3

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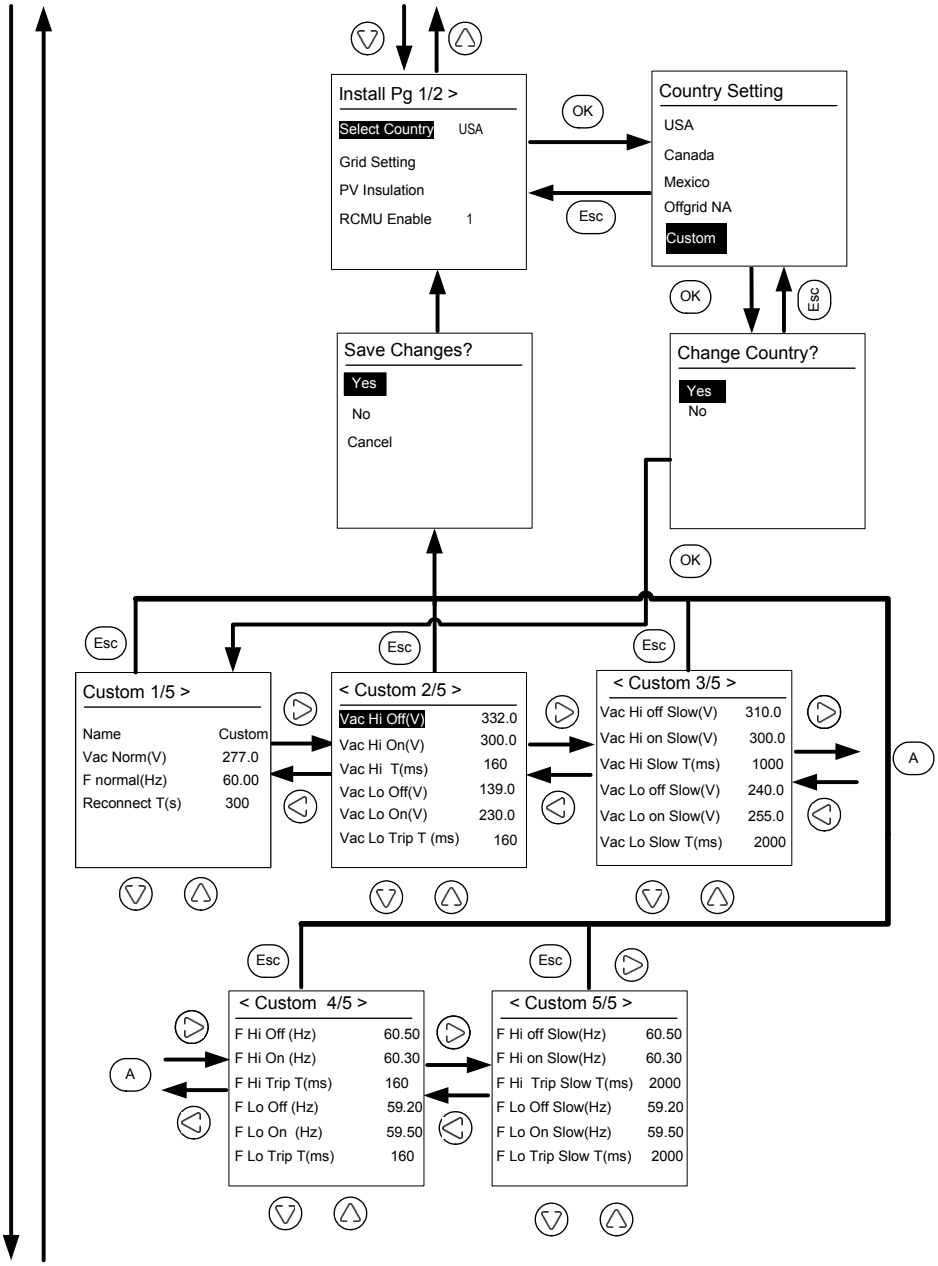

Figure 3-10 Menu structure -4

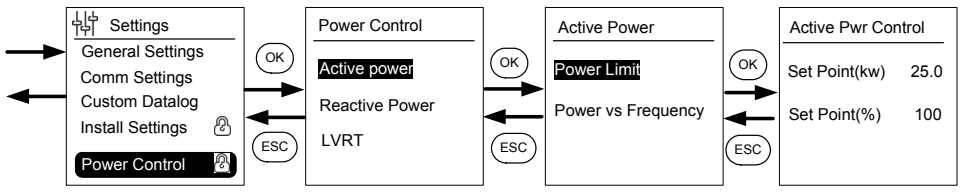

Figure 3-11 Menu structure -5

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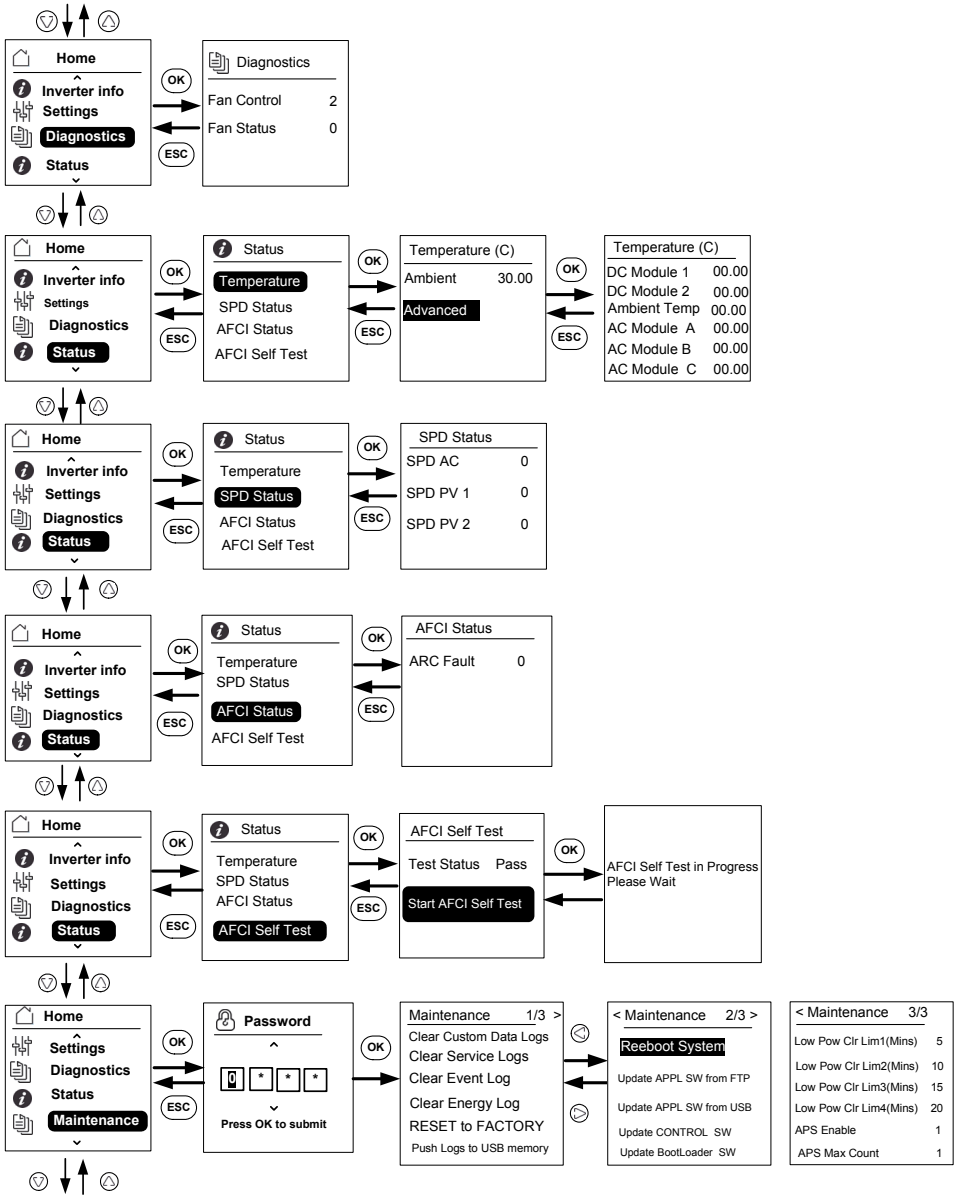

Note: It is not required to enter the password for each subsequent entry, but will be prompted for an entry after an idle time of five minutes.

Figure 3-12 Menu structure -6

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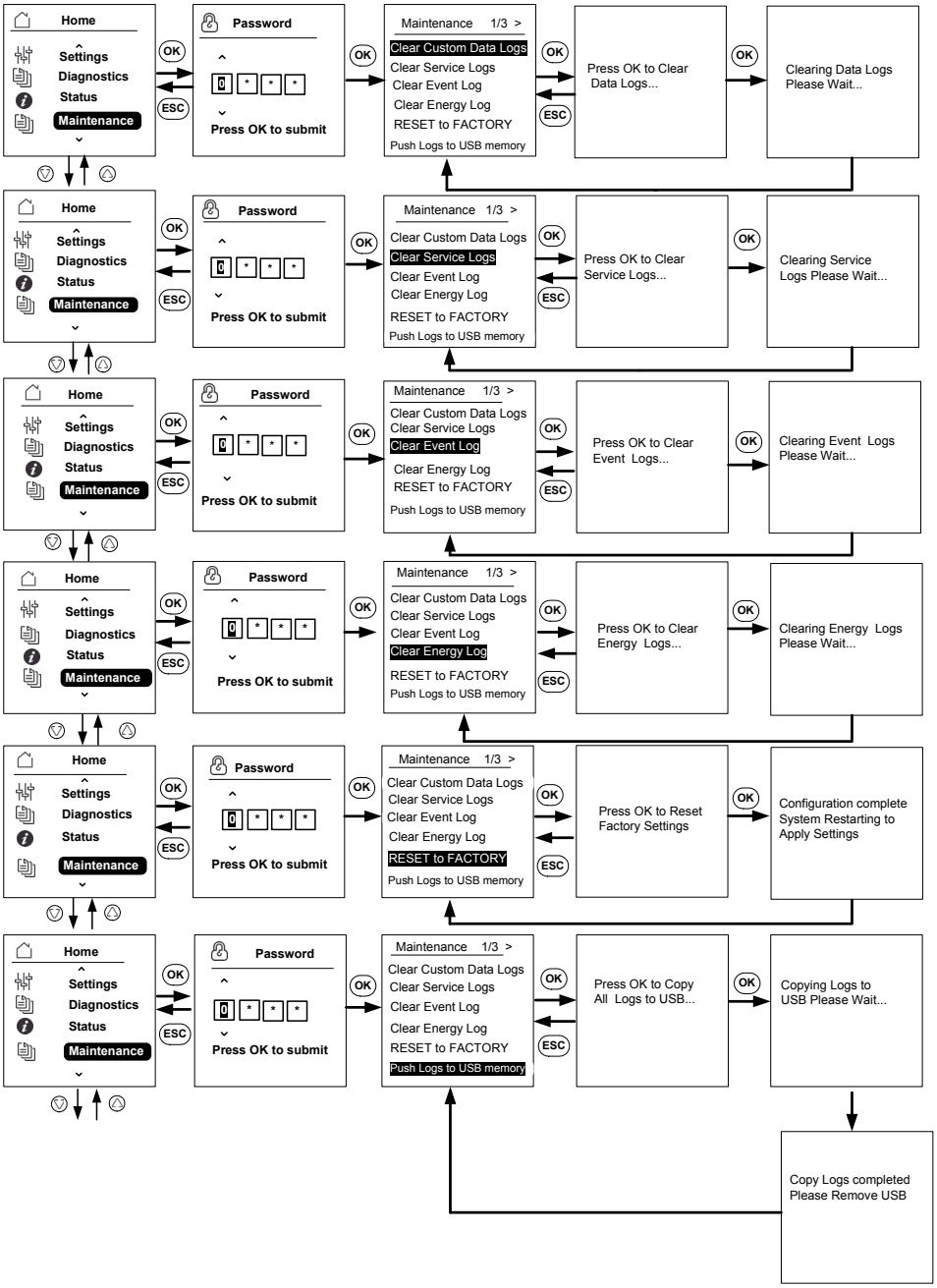

Figure 3-13 Menu structure -7

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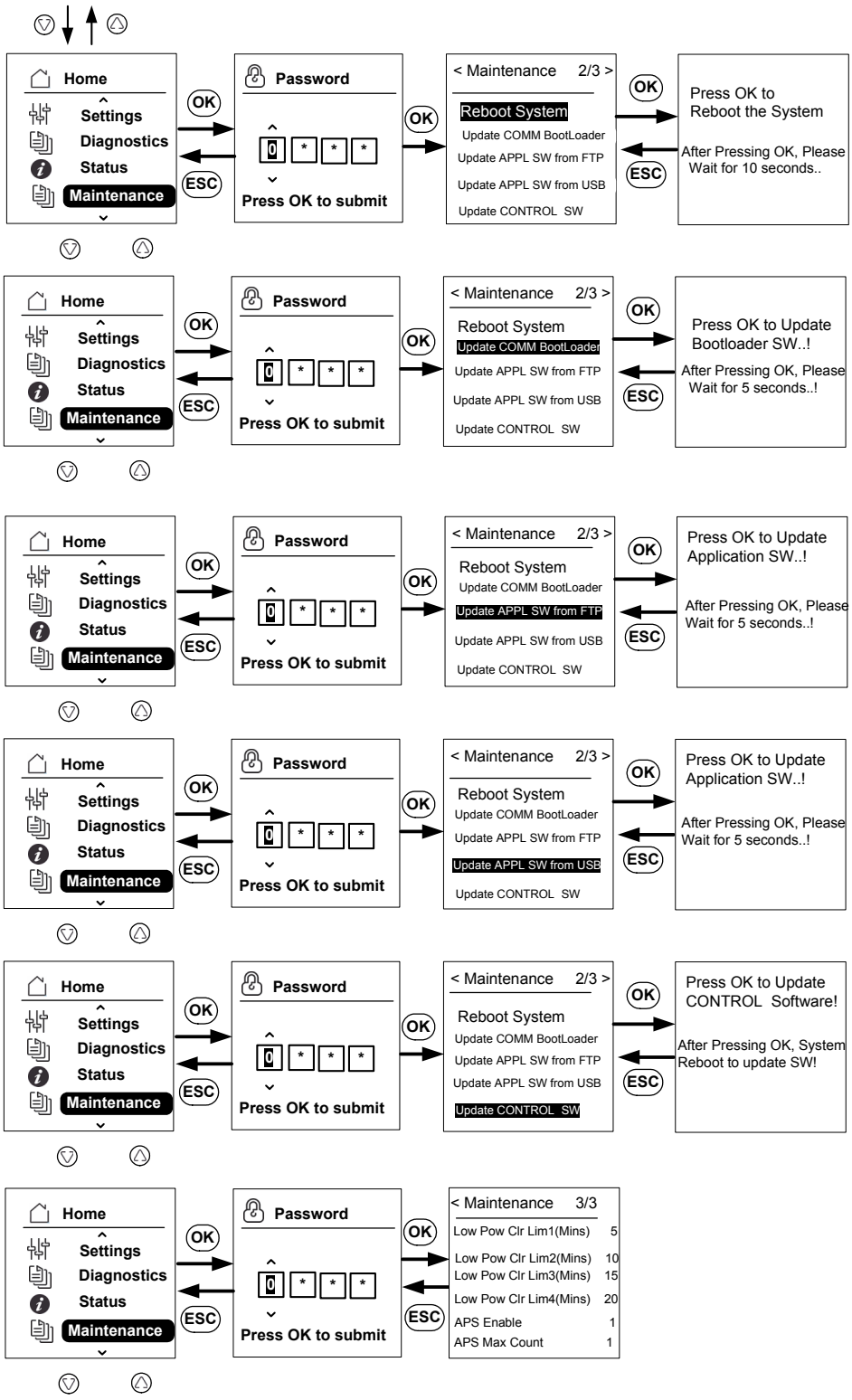
Home
Settings
Diagnostics
Status
Maintenance
OK
ESC
Password
Press OK to submit
< Maintenance 2/3 >
Reboot System
Update COMM BootLoader
Update APPL SW from FTP
Update APPL SW from USB
Update CONTROL SW
Press OK to Reboot the System
After Pressing OK, Please Wait for 10 seconds..
Press OK to Update Bootloader SW..!
After Pressing OK, Please Wait for 5 seconds..!
Press OK to Update Application SW..!
After Pressing OK, Please Wait for 5 seconds..!
Press OK to Update CONTROL Software!
After Pressing OK, System Reboot to update SW!
< Maintenance 3/3
Low Pow Clr Lim1(Mins) 5
Low Pow Clr Lim2(Mins) 10
Low Pow Clr Lim3(Mins) 15
Low Pow Clr Lim4(Mins) 20
APS Enable 1
APS Max Count 1

Figure 3-14 Menu structure -8

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Home Page

To navigate through the menus:

- In the Home page, press any of the four navigation buttons.
- To go to the previous screen or to a higher-level menu, press the ESC button.

During the normal operation of the inverter, the LCD shows the Home page as shown below.

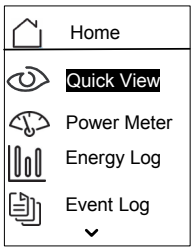

Figure 3-15 Home page

Inverter Information

The Inverter Information screen displays the following information about the inverter:

- Inverter serial number
- Inverter FGA
- Wiring box serial number
- Wiring box FGA
- Communication application firmware version number
- Communication boot loader firmware version number
- DC-AC control firmware application version number
- DC-DC control firmware application version number

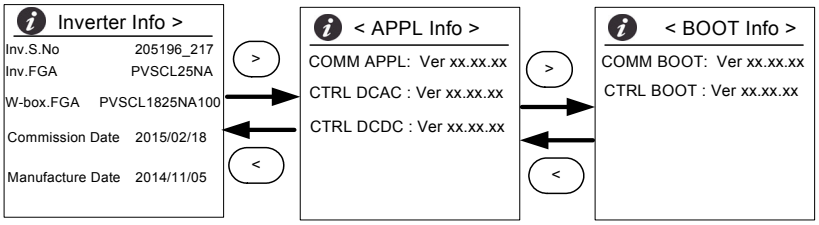

Figure 3-16 Inverter Info

To view the Inverter Information screen:

From the main menu, select **Inverter Information**, and then press the OK button.

Logs

You can view the event logs and energy logs through the Home page screen as shown in Figure 3-8 on page 3–11.

Event Log

The event log shows a maximum of 10 most recent events. The most recent event is shown at the top of the list. There are four submenus under Event Log.

- Active Services
- All Logs
- Service Logs
- Event Logs

- Active Services show the list of events that have occurred most recently and are not cleared.
- All Logs show both services and events as per the sequence of occurrence.
- Service Logs show all the events or warnings that have occurred during any abnormal operating condition.
- Event Logs show the list of all events.

Use the scroll button to navigate through the list of events. To know more details about an event, select the event and then press the OK button.

Energy Log

The Energy Log menu shows the power generation over the:

- Current or last year
- Previous and current month
- Previous and current week
- Yesterday’s and today's energy
- Energy summary

Use the scroll button to navigate through the list of submenus. To view the energy produced over a specific period of time, select the appropriate energy log menu and then press the OK button.

4 Troubleshooting

Chapter 4, “Troubleshooting” describes the event and service messages that might be displayed on the LCD of the inverter and the recommended solutions.

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Messages

The inverter indicates events/ warnings on the display during any abnormal operating conditions. Table 4-1 describes alert messages that might be displayed on the LCD of the inverter.

Note: The Event code in the below table refers to the alert code that can be read through the Modbus communications.

Table 4-1 Alert message descriptions

	Event Code	Definition	Description
Services	10	AC relay flt	Line Tie relay is either welded or opened. * If the event persists, contact Schneider Electric customer service.
	0031	AC curr snsr flt	The Grid Current Sensor is not measuring the grid current accurately. * If the event persists, contact Schneider Electric customer service
	0032	AC temp snsr flt	The AC Module temperature is either very high or low. * If the event persists, contact Schneider Electric customer service
	0033	DC temp snsr flt	The DC Module temperature is either very high or low. * If the event persists, contact Schneider Electric customer service.
	0047	AC volt snsr flt	The Grid voltage sensor fails to measure the voltage accurately. Reset the unit by turning off the DC disconnect. * If the event persists, contact Schneider Electric customer service.
	0131	Low Eff flt	The losses in the unit are higher than normal and hence the efficiency is low. *If the event persists, contact Schneider Electric customer service.

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Table 4-1 Alert message descriptions (Continued)

	Event Code	Definition	Description
	0203	DC init flt	Initialization of Control Processor fails. * If the event persists, contact Schneider Electric customer service.
	0204	DC BIST flt	Built in Self Test of the Control Processor fails. * If the event persists, contact Schneider Electric customer service.
	0205	AC init flt	Initialization of Control Processor fails. * If the event persists, contact Schneider Electric customer service.
	0206	AC BIST flt	Built in Self Test of the Control Processor fails. * If the event persists, contact Schneider Electric customer service.
	0702	RCMU flt	The Earth Leakage current is repeatedly detected to be greater than limited value. Check whether the insulation between the PV to ground is higher than the specified value. * If the event persists, contact Schneider Electric customer service.
	0704	AFD selftest fail	Arc fault detector unit failure. *Arc fault detection module failure detected. *If the event persists, contact Schneider Electric customer service.

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Table 4-1 Alert message descriptions (Continued)

	Event Code	Definition	Description
	0705	PV I/P reversed	PV input wiring reversed. *Have a qualified installer check the PV input wiring, correct the wiring connections and restart the unit.
	0708	RCMU flt red	The Earth Leakage current is greater than the limited value. It is checked for repeated occurrence. If the repetition occurs more than four times, then this fault occurs. Check whether the insulation between the PV to ground is higher than the specified value. * If the event persists, contact Schneider Electric customer service.
	0709	Arc flt	The unit has detected an Arc fault condition. For more details, refer the “Arc Fault Detection” on page 2–53. *If the fault occurs frequently, contact Schneider Electric customer service.
	0710	Sys cfg init flt	The System configuration done by the user/ installer is incorrect. Check and select proper configuration. *If the event persists, contact Schneider Electric customer service.
	0711	Share sys cfg flt	The internal configuration shared between processors is incorrect. Disconnect both the AC and DC and restart the inverter. *If the event persists contact Schneider Electric customer service.
	0712	AC int cfg flt	The internal configuration is incorrect on the Control Processors. Restart the unit. *If the event persists contact Schneider Electric customer service.

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Table 4-1 Alert message descriptions (Continued)

	Event Code	Definition	Description
	0713	DC int cfg flt	The internal configuration is incorrect on the Control Processors. Restart the unit. *If the event persists contact Schneider Electric customer service.
Error	714	RPO power mod err	RPO power module error. The RPO power module has failed. * Contact Schneider Electric customer service
	2018	AC inter-comm err	This error occurs, when the internal communication between processors in the control board fails after time out. Reset the unit by turning OFF both the DC disconnect and AC breaker (external). * If the event persists, contact Schneider Electric customer service.
	2060	AC low temp	The temperature on the AC power modules is lower than the limits. The unit does not start. Wait till the temperature rises to a value greater than the normal temperature.
	2061	AC modules OT	The inverter ambient or AC module temperature is beyond the safe operating limits of the inverter. Switch off the power to the unit, for it to cool. * If the event persists, contact Schneider Electric customer service.
	2062	DC mod12 OT	The temperature on DC Power modules is beyond the limits. The ambient is beyond the operating limits. Switch off the power to the unit, for it to cool. * If the event persists, contact Schneider Electric customer service.

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Table 4-1 Alert message descriptions (Continued)

	Event Code	Definition	Description
	2101	DC inter-comm err	This error occurs, when the internal communication between processors in the control board fails after time out. Reset the unit by turning OFF both the DC disconnect and AC breaker (external). * If the event persists then contact Schneider Electric customer service.
	2102	DCAC comm err	Communication error in the Control processor detected by Comm processor. Restart the inverter. * If the event persists, contact Schneider Electric customer service.
	2401	AC UF fast err	The Grid Frequency is below the set limits. The fall in the grid frequency is rapid. Check the frequency, if it is within the operating limits and the problem persists, contact Schneider-Electric.
	2402	AC OF fast err	The Grid Frequency is above the set limits. The rise in the grid frequency is rapid. Check the frequency, if it is within the operating limits and the problem persists, contact Schneider-Electric.
	2406	AC UV fast err	The Grid Voltage is below the set limits. The fall in the grid voltage is rapid. Check the voltage, if it is within the operating limits and the problem persists, contact Schneider-Electric.
	2407	AC OV fast err	The Grid Voltage is above the set limits. The rise in the grid voltage is rapid. Check the voltage, if it is within the operating limits and the problem persists, contact Schneider-Electric.

Table 4-1 Alert message descriptions (Continued)

	Event Code	Definition	Description
	2408	AC UV inst	The Grid Voltage is above the set limits instantaneously. Check the voltage, if it is within the operating limits and the problem persists, contact Schneider-Electric.
	2410	AC OV inst	The Grid Voltage is below the set limits instantaneously. Check the voltage, if it is within the operating limits and the problem persists, contact Schneider-Electric.
	2411	AC OC inst	The Grid Current is above the set limits instantaneously. Restart the inverter. * If the event persists, contact Schneider Electric customer service.
	2415	AC OV avg err	The Grid Voltage is above the limits over a set period of time. Restart the inverter. * If the event persists, contact Schneider Electric customer service.
	2416	AC UF slow err	The Grid Frequency is below the set limits. Check the frequency, if it is within the operating limits and the problem persists, contact Schneider-Electric.
	2417	AC OF slow err	The Grid Frequency is above the set limits. Check the frequency, if it is within the operating limits and the problem persists, contact Schneider-Electric.
	2418	AC UV slow err	The Grid Voltage is below the set limits. Check the voltage, if it is within the operating limits and the problem persists, contact Schneider-Electric.

Table 4-1 Alert message descriptions (Continued)

	Event Code	Definition	Description
	2419	AC OV slow err	The Grid Voltage is above the set limits. Check the voltage, if it is within the operating limits and the problem persists, contact Schneider-Electric.
	2450	No-Grid err	Grid is not available
	2460	AC OC err	The current measured in any one phase is beyond the specified limits. Restart the inverter. * If the event persists, then contact Schneider Electric customer service.
	2605	PV 1 OV err	The voltage measured at PV1 input terminal is greater than the specified limit (>950 V). Check for PV configuration and voltage.
	2606	PV 2 OV err	The voltage measured at the PV2 input terminal is greater than the specified limit (>950 V). Check for PV configuration and voltage.
	2616	PV insulation err	The PV insulation measured between any PV input to earth is lesser than the specified limit. *Have a qualified installer to check for PV resistance.
	2624	PV12 OC err	The current measured on both the PV channels is higher than the rated values. * If the event persists, contact Schneider Electric customer service.

Table 4-1 Alert message descriptions (Continued)

	Event Code	Definition	Description
	2631	PV UV err	PV voltages on both the channels are lesser than the specified value (<200 V).
	2646, 2647	RCMU err red	RCMU error detected. Excessive steady state residual current or sudden change in residual current. * The inverter resumes normal operation after sometime. *Wait for the inverter to resume power production.
	2647	RCMU err	RCMU error detected by DC processor. Excessive steady state residual current or sudden change in residual current. * The inverter resumes normal operation after sometime. *Wait for the inverter to resume power production.
	2648	Low Eff err	The losses in the unit are higher than normal. So efficiency is low. Contact Schneider Electric.

Table 4-1 Alert message descriptions (Continued)

	Event Code	Definition	Description
	7000	Comm Intenal Err	An Internal Error is detected by Comm processor due to the following conditions: • The hardware in the communication board fails. • Communication processor fails to communicate with the Control processors. • Initialization of the communication processor fails. • Internal communication with its peripherals fails. • Built in self test fails. • The file system is not proper or initialization of processor fails. • The memory test of comm processor fails. • The watch dog fails. • Incorrect configuration parameters are entered. • Communication with DUI processor fails. • MD5 sum failure or Firmware loading fails. * If the event persists, contact Schneider Electric customer service with display details.

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Table 4-1 Alert message descriptions (Continued)

	Event Code	Definition	Description
	8000	AC internal err	An Internal Error is detected by the processor due to the following conditions: • The grid current measured exceeds the rating of the unit. • The DC bus voltage is greater than the trip value. • The top or bottom DC bus voltage is greater than the trip value. • The voltage difference between top and bottom DC bus voltage is greater than the set value. • The DC bus voltage is lesser than the set value. • The DC voltage sensor fails to measure the DC BUS voltage. • The ADC reference is not within the tolerance of 1.5V. • The Phase lock loop fails during inverting. * If the event persists, contact Schneider Electric customer service with the display details.

Table 4-1 Alert message descriptions (Continued)

	Event Code	Definition	Description
	9000	DC internal err	An Internal Error is detected by the processor due to the following conditions: • The PV current measured exceeds the rating of the unit. • The DC bus voltage is greater than the trip value. • The top or bottom DC bus voltage is greater than the trip value. • The voltage difference between top and bottom DC bus voltage is greater than the set value. • The DC bus voltage is lesser than the set value. • The DC voltage sensor fails to measure the DC BUS voltage. • The ADC reference is not within the tolerance of 1.5V • The auxiliary power supply output is out of range. * If the event persists, contact Schneider Electric customer service with the display details.
Warning	2633	PV1 OC wrn	PV1 Over current detected, hence the power output from PV1 is stopped. * If the event persists, contact Schneider Electric customer service.
	2634	PV2 OC wrn	PV2 Over current detected, hence the power output from PV2 is stopped. * If the event persists, contact Schneider Electric customer service.
	4003	Replace fan	Fault or FAN EOL detected and needs FAN replacement. * Contact Schneider Electric customer service.

Table 4-1 Alert message descriptions (Continued)

	Event Code	Definition	Description
	4004	Loss of cooling	Fan Control circuit hardware failure has been detected. * Contact Schneider Electric customer service.
	4061	Ambient OT wrn	The ambient temperature has crossed the nominal operating range and the unit starts to derate.
	4065	DC mod1 OT wrn	The DC module1 temperature crossed the nominal operating limits and the unit starts to derate.
	4066	DC mod2 OT wrn	The DC module2 temperature crossed the nominal operating limits. *The unit may start to derate and recover, once the temperature reduces to a value less than the threshold value.
	4068	DC mod1 OT trip	The DC Module1 over temperature is detected and the power output from PV1 channel is stopped. *The PV1 channel resumes power production once the temperature reduces to a value less than the threshold value.
	4069	DC mod2 OT trip	The DC Module2 Over temperature detected and power output from PV2 channel is stopped. *The PV2 channel resumes the power production once the temperature reduces to a value less than the threshold value.
	4656	PV1 UV wrn	The input PV voltage is lower than the nominal operating limits at the PV1 input terminal.
	4657	PV2 UV wrn	The input PV voltage is lower than the nominal operating limits at the PV2 input terminal.

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Table 4-1 Alert message descriptions (Continued)

	Event Code	Definition	Description
	4660	AC mod OT wrn	The temperature on the AC module has crossed the normal operating limit and the unit starts to derate.
	4661	PV1 SPD service	The SPD module connected on the PV1 input channel reached EOL and needs replacement. * Contact Schneider Electric customer service.
	4662	PV2 SPD service	The SPD module connected on the PV2 input channel reached EOL and needs replacement. * Contact Schneider Electric customer service.
	4663	AC SPD service	The SPD module connected on the AC output channel reached EOL and needs replacement. * Contact Schneider Electric customer service.
	4700	Low power wrn	The input PV power is low. The unit does not go online and recovers when sufficient input power is available.

5 Maintenance

Chapter 5, “Maintenance” contains information and procedures for performing preventive maintenance on the inverter and the wiring box.

This manual is for use by qualified personnel only

Periodic Maintenance

The term “qualified personnel” is defined in page iii of this manual. Personnel must be equipped with appropriate PPE and follow the safe electrical work practices. The inverter is energized from the AC grid and up to four PV circuits. Before servicing the inverter or accessing the wiring box, disconnect all the sources and wait at least five minutes to allow the internal circuits to discharge. Operating the RPO (Remote Power Off) circuit or switching off the inverter does not isolate the inverter from all the power sources. The internal parts and the external wiring remain live unless the PV and AC circuits are disconnected as appropriate for each model of the inverter.

To ensure reliable operation of the inverter, it is recommended for a semi-annual maintenance cycle, based on less severe environment site conditions. For sites with blowing dust or for sites subject to extreme temperatures, frequency of the maintenance cycle should be increased.

Note: Use only original spare parts provided by the manufacturer. Use of non-original parts invalidates the warranty.

For any problems associated with the inverter, contact Schneider Electric.

⚠ DANGER

HAZARD OF ELECTRIC SHOCK AND FIRE

- All electrical work must be done in accordance with local electrical codes.
- The Conext CL inverter has no field/ user serviceable parts inside, only the wiring box has user replaceable parts (Fuse & SPD)*. To be installed and serviced only by qualified personnel equipped with appropriate PPE and following safe electrical work practices.
- Before installation, de-energize the AC and PV sources using external disconnecting means provided in the installation, and test using a meter rated at least 1000 VDC and 600 VAC to make sure all circuits are de-energized. Follow a lock-out tag-out procedure.
- Do not connect the PV conductors until the inverter is earthed either through the AC connection or through the earthing terminal.

Failure to follow these instructions will result in death or serious injury.

*Refer the applicable model number in “Wiring Box Configurations” on page 2–14.

Factors Affecting the Inverter Performance

This section describes several factors that affect the performance of the inverter.

PV Array Factors

- PV array ratings

PV arrays are rated under standard conditions as listed below:

- specified illumination (1000 W/m^2)
- spectrum of the light
- specified temperature (77 ° F/ 25° C)

This is called the Standard Test Condition (STC) rating and is the figure that appears on the PV module nameplate label.

- Expected Performance

Due to several unavoidable environmental factors, a PV array produces only around 60 to 70% of its peak STC-rated output for a well designed and installed PV system on a typical day.

- Temperature and reduced output

The PV array temperature affects the output of the entire system. As the temperature of the array surface rises, its energy output decreases. The arrays mounted on roof also collect the heat generated by the roof surface (or trapped under the array) and will produce less output than pole-mounted arrays, which allow greater air circulation behind the panels.

Note: The Conext CL inverter reduces the energy output to protect its electronic circuits from overheating and to protect from possible damage under high heat conditions. For maximum output under hot climate, mount the inverter in a shaded location with good air flow.

- Partial shade

The shading of even only a single module of the array reduces the output of the entire system. For example, the shadow caused by a utility wire or tree branch on a portion of the array's surface. This reduces the total output, though the output loss is not proportional to the shading.

The Conext CL inverter is designed to maximize its energy production in the above situation using its MPPT algorithm.

Other Factors

Other factors that contribute to system losses are:

- Dust or dirt on the array
- Fog or smog

- Mismatched PV array modules, with slight inconsistences in performance from one module to another
- Wire losses
- Utility grid voltage

For additional information and technical notes concerning PV array performance, refer to solar.schneider-electric.com.

Performing General Maintenance

Follow these simple routines to ensure long years of service and optimal performance of the inverter.

- Keep the unit away from dust and debris.
- Clean the PV array under non-illuminated conditions whenever it is visibly dirty.
- Periodically inspect the system to make sure that all the wiring and supports are securely in place.
- Maintain a log of system performance readings so that you can recognize when the performance becomes inconsistent.

Semi-Annual Maintenance

Have qualified personnel (as defined on page iii) perform the following semi-annual maintenance:

1. Visually inspect all the conductors and connectors at the bottom of the inverter for signs of corrosion or overheating.
2. Check that all the connectors, screws, and cables are connected properly and are tightened to the proper torque specified in this manual.
3. If there are any defective parts, contact Schneider Electric.
4. Clean the louver cover and fans:
   a) Loosen the two screws of the louver cover (one screw at each of the corners of the cover, as shown by the arrows in Figure 5-1 on page 5–5 and Figure 5-2 on page 5–5).

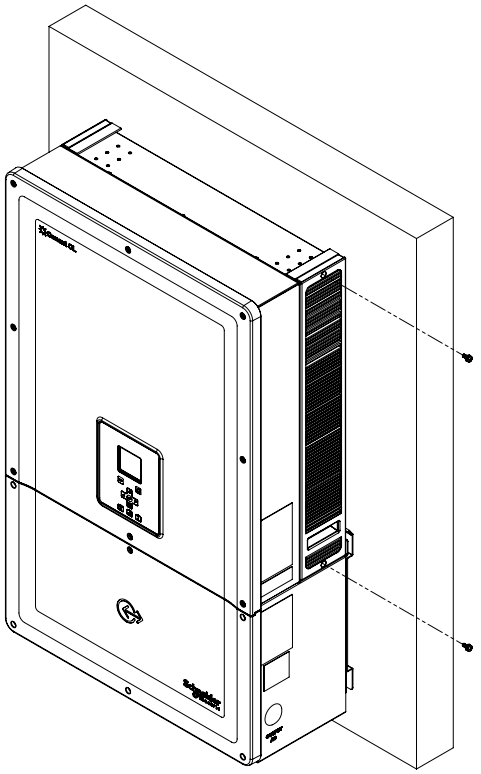

Figure 5-1 Loosening the louver cover- right side

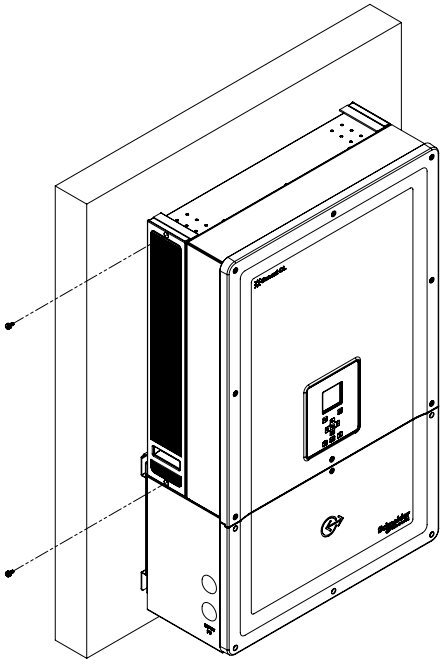

Figure 5-2 Loosening the louver cover- left side

b) Remove the louver cover as shown in the figure below.

i Slide up the louver cover.

ii Pull out the louver cover.

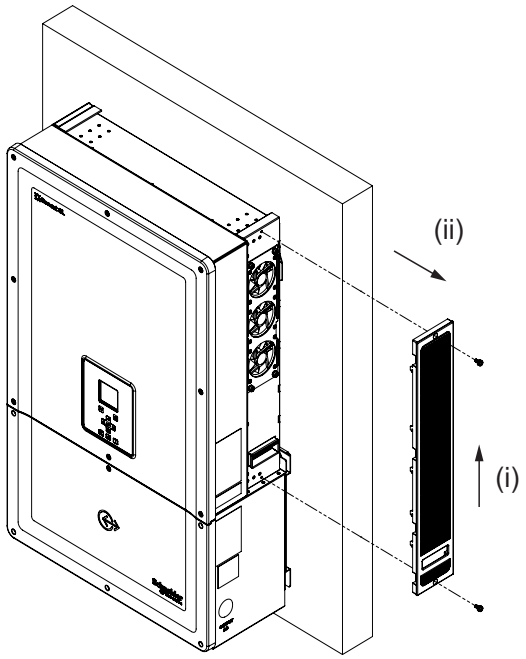

Figure 5-3 Removing the louver cover- right side

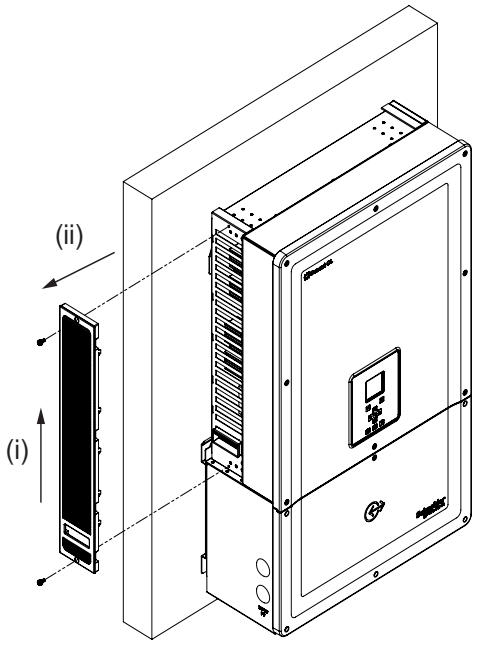

Figure 5-4 Removing the louver cover- left side

Cleaning the Louver Cover

After removing the louver cover gently with a screw driver, clean the cover with a soft brush, paint brush or compressed air. Ensure that the rear enclosure is covered properly while cleaning, to prevent the entry of foreign bodies.

Cleaning the Fans

The fans are located at the right hand side of the unit.

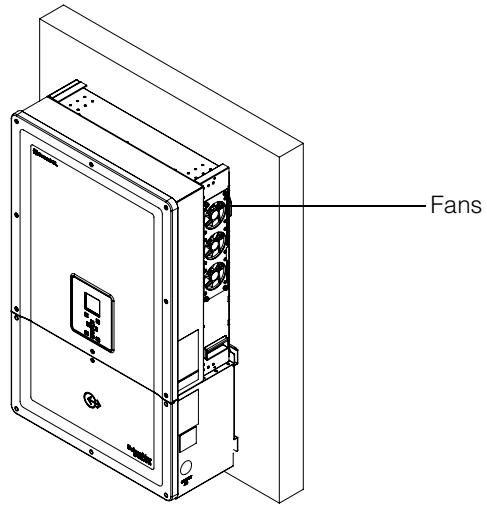

Figure 5-5 Fan location

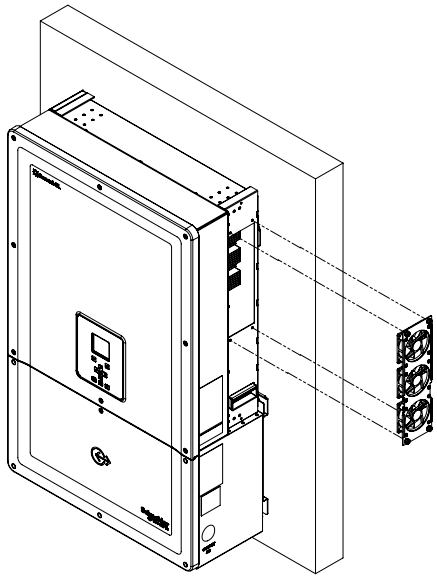

Figure 5-6 Removing the fan

A typical single fan removal is as shown in Figure 5-6.

Fan maintenance:

1. Unfasten the screws of fan assembly and remove the fan gently with a screw driver.
2. Unlock the fan connectors as shown below in Figure 5-7.
3. Take the fan out and clean it only with a soft brush or clean cloth.

NOTICE
RISK OF EQUIPMENT DAMAGE Do not use compressed air for cleaning the fan, as this may damage the blades of the fan. **Failure to follow these instructions can result in equipment damage.**

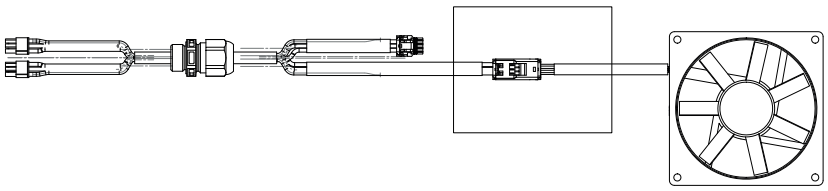

Figure 5-7 Removing the fan connector

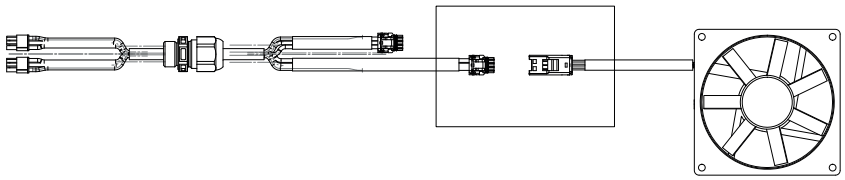

Figure 5-8 Inserting the fan connector

4. Insert the fan connectors back as shown in Figure 5-8. Make sure that the connector clicks in place.

Note: Ensure to connect all the fan connectors back in position.

5. Mount the fans back at proper location, refer Figure 5-5.
6. Insert the louver covers back and ensure that the louver covers are secured properly in place, refer Figure 5-3 and Figure 5-4.
7. Check for proper working of fans using the Diagnostics menu as shown in Figure 5-9.

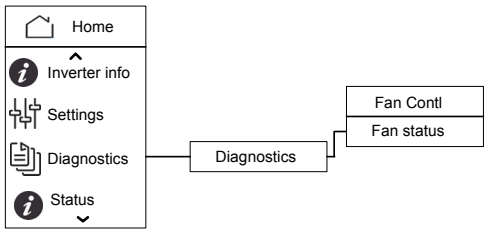

Figure 5-9 Diagnostics menu

SPD Replacement

If any of the SPDs reach End of Life, there will be a warning message active on the display. In the event of SPD open fault, follow the procedure below:

- Disconnect the DC and AC power to the wiring box through appropriate external means.
- Open the wiring box.
- Inspect the PV and AC wiring and rectify any short circuit or other faults on the input and output PV array circuits.
- Observe the inspection window provided in the SPD cartridge.
  - A red color in the cartridge indicates that the SPD is damaged.
- Replace the damaged SPD cartridge with a new working cartridge.
- Clear the SPD protection open event on the display.
- Close the wiring box.

The above mentioned procedures should be performed only by a trained technician.

Fuse Replacement

In the event of a short circuit in any of the PV string, the inverter will display ‘Low PV1 input voltage’ or ‘Low PV2 input voltage’ event message, and there could be a possibility of string fuse failure.

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, FIRE AND EQUIPMENT DAMAGE

- Do not attempt to replace the fuse without rectifying the PV array short circuit fault, failing to which, there can be a risk of arc.
- Turn Off the DC and AC breaker before opening the wiring box cover.

Failure to follow these instructions will result in death or serious injury.

To replace the fuse,

1. Turn off the DC disconnect and AC breaker.
2. Open the wiring box cover.
3. Inspect the PV circuit and rectify if there are any faults.
4. Replace the faulty fuse with a new one.
5. Close the cover.

Recommended Fuse: Part number: PV1510F

Make: Cooper Bussman

Rating:1000 VDC, 15 A.

AFD Fault

If the inverter is tripped due to AFD fault and the display message shows' Arc Fault', follow the procedure below to restore the inverter operation. The inverter will not start until the AFD fault is manually reset.

The below mentioned procedures should be performed only by a trained technician.

1. Ensure that there is no physical damage observed in the DC input wiring.
2. Disconnect the AC (external) and DC breaker.
3. Rectify the cause of the Arc Fault event.
4. Turn ON the AC and DC breaker.
5. Acknowledge the 'AFD Fault' in the LCD display.

The inverter will resume operation.

De-commissioning

To decommission the inverter

1. Turn Off the AC and DC breaker.
2. Open the wiring box cover as shown in Figure 2-25 on page 2–28.
3. Remove all the communication interface connections.
4. Unlock the inverter and wiring box power connectors using the thumb screw provided. Refer to the Figure 2-31 on page 2–31 for the connector location.
5. Unfasten the guide bush screw of the wiring box, refer Figure 2-30 on page 2–31 for the screw location.
6. Ensure the inverter is free to lift from the wiring box.
7. Lift the inverter from the mounting bracket and keep it in a safe place.
8. Close the wiring box cover. Refer to the Figure 2-32 on page 2–32.

To decommission the Wiring box

After de-commissioning the inverter,

1. Remove the AC and DC wiring.
2. Close the connector cover using the guide bushing. Refer to the Figure 2-26 on page 2–29 for guide bushing location.
3. Unfasten the four M8 screws. Refer to the Figure 2-24 on page 2–28 for screw location.
4. Remove the wiring box from the bracket and keep it in a safe place.

Firmware Upgrade process

The below mentioned procedures should be performed only by a trained technician.

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, FIRE OR ARC FLASH

A voltage of 1000 VDC and AC grid voltage will be present inside the wiring box. Ensure to use all the necessary PPE.

Failure to follow these instructions will result in death or serious injury.

Note: During firmware upgrade process, ensure:

- not to disconnect the interface cables.
- no power interruption happens.

Such interruptions cause unsuccessful firmware upgrade.

In Conext CL, the firmware can be upgraded by using any of the following methods:

- USB (Local firmware upgrade)
- Ethernet (Local/ Remote firmware upgrade)

USB

For upgrading the firmware locally, use an external USB flash drive (not included), and follow the steps as described below:

1. Ensure to delete older firmware versions stored in the USB and

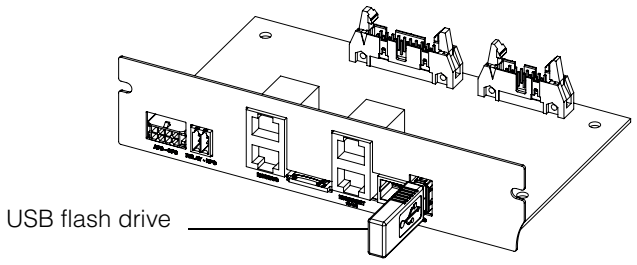

Figure 5-10 Communication interface with USB flash drive

2. Copy the latest firmware into the USB storage drive that will be used to load the firmware to the inverter. The latest version of firmware can be downloaded from solar.schneider-electric.com.
3. Open the wiring box cover.
4. Ensure either AC or sufficient PV input(>150 V) is available to power up control circuit of the inverter.
5. Connect the USB drive to the USB device socket. The inverter display will now wait for user confirmation to start the upgrade process.
6. Press the OK button. The inverter now starts upgrading the new firmware available in the USB drive. The upgrade process will take approximately 20 to 25 minutes.

After completing the upgrade process, the inverter will restart.

Note:

- The user confirmation window will be active only for few seconds.
- If the OK button is not pressed, ‘NO REQUEST RECEIVED’ appears and the system returns to the home screen.

7. Under ‘Inverter Info’ menu verify the firmware version number in the display with the latest firmware version number. If it matches, follow step 9 or else step 8.

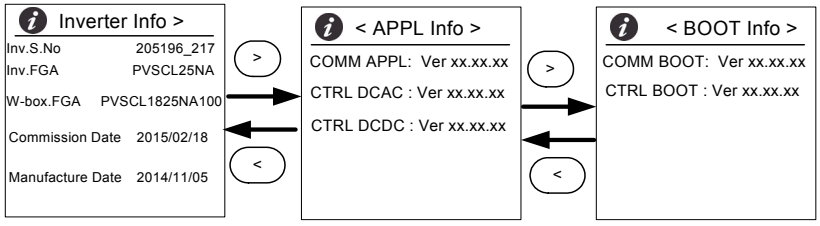

Figure 5-11 Inverter Info

8. Under Maintenance menu, click ‘Update Control SW’.
9. On successful completion of the upgrade process, unplug the USB drive.
10. Close the cover of the wiring box properly.
11. In case of any event or failure in the upgrade process, contact Schneider Electric.

Ethernet (Webpages)

1. Establish the connection as mentioned in “Web Interface” on page 2–55.
2. Copy the latest firmware to the personal computer. The latest version of firmware can be downloaded from solar.schneider-electric.com.

The webpage dashboard screen is displayed as shown below.

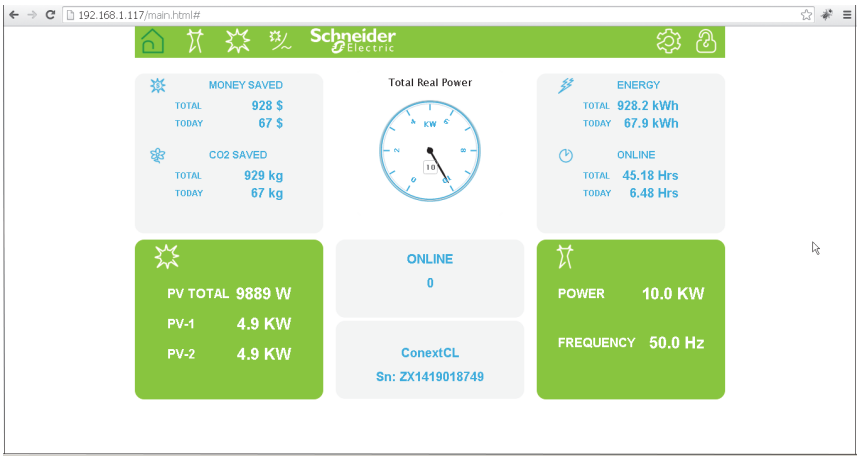

Figure 5-12 Web page dashboard screen

3. Click on the Settings icon( ).The below screen appears.

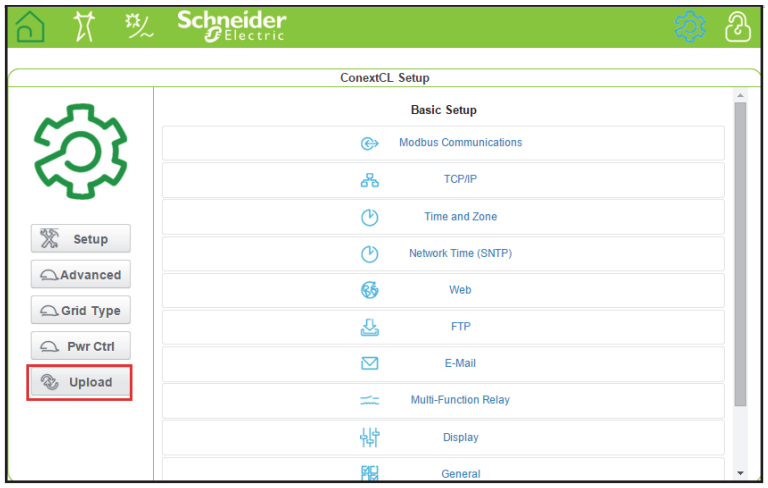

Figure 5-13 Web page upload screen

4. Select the Upload option (displayed on the left hand side of the screen).

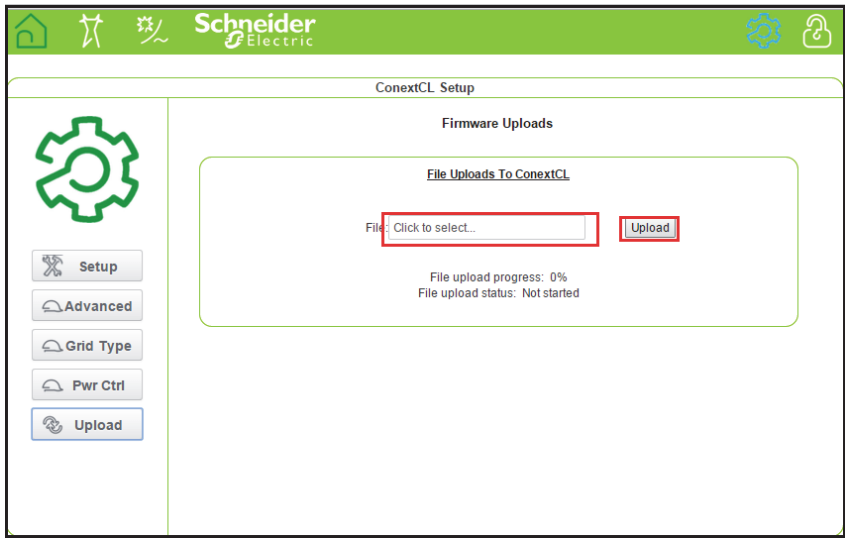

Figure 5-14 Web page firmware upgrade screen

5. Click on the 'Click to select' field and navigate to the firmware file in the personal computer.
6. Select the file.
7. Under 'Inverter Info' menu verify the firmware version number in the display with the latest firmware version number. If it matches, perform step 9 or else step 8.

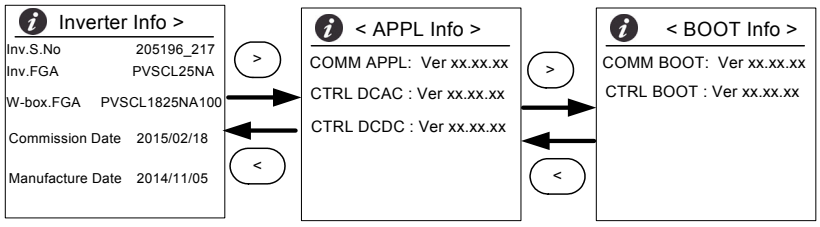

Figure 5-15 Inverter Info

8. Under Maintenance menu, click 'Update Control SW'.
9. Click upload to start the firmware upgrade process. On successful completion of firmware upgrade process, the inverter will reboot.

Pushing Logs to USB device

To save the Service, Event, Energy and Custom Data Logs to a USB storage device:

From the Maintenance menu, select ‘Push Logs to USB memory’.

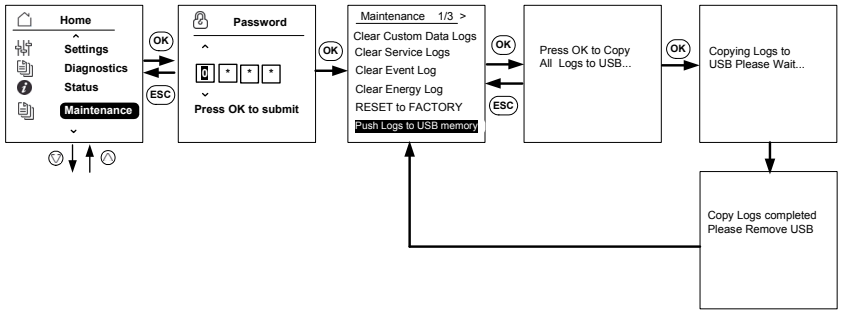

Figure 5-16 Pushing logs to USB

A Specifications

Appendix A provides the environmental, electrical, and other specifications for the inverters.

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Note:

- Specifications are subject to change without notice.
- Refer to solar.schneider-electric.com for the latest list of approved countries.

System Specifications

Table A-1 System specifications

Parameter	Unit of measurement	Conext CL 18000NA	Conext CL 25000NA
Input (DC)			
Full power MPPT voltage range	Volts	300 - 800	500 - 800
Operating voltage range	Volts	250 - 1000	
Maximum input voltage, open circuit	Volts	1000	
Rated input voltage	Volts	720	
Minimum input voltage	Volts	150	
Maximum input current	Ampere	32	26.5
Number of independent MPPT input		2/1	
Absolute maximum PV array short circuit current per MPPT	Ampere	36	
Nominal DC input power (cos phi = 1)	Watts	19000	26500
Maximum DC input power per MPPT	Watts	11400	15900
DC connection type		Base: Push type connector Essential & Optimum: Fuse holder	
Reverse polarity protection		Short circuit diode	
Output (AC)			
Nominal output power	KVA	18	25
Rated Grid Voltage	Voltage (L-L)	480	
AC voltage range	Voltage (L-L)	422 - 528	

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Table A-1 System specifications (Continued)

Grid Connection Type		3-phase 4-wire wye	
Frequency	Hertz	60	
Frequency range (adjustable)	Hertz	+/- 3	
Start up current	Ampere	0	
Maximum output current	Ampere	24	31
Maximum output short circuit current	Ampere	40 A (rms) for 100 msec	
Total harmonic distortion	Percentage	<3 @ rated power	
Power factor		> 0.99 @full power Adjustable: 0.8 capacitive to 0.8 inductive	
AC connection type		Bottom and side conduit/cable entry Spring cage clamp connector	
Grid monitoring		AC voltage, AC frequency, and anti- islanding protection	
Output characteristics		Current source	
Output current waveform		Sine wave	
Efficiency			
Peak	%	98.0	98.4
CEC	%	97.5	98.0
General Specifications			
Power consumption, night time	Watts	<3	
Enclosure Rating		TYPE 4 (electronics) /TYPE 3R (rear side)	
Cooling		Fan cooled	
Inverter weight	lb (kg)	119 (54)	
Inverter shipping weight (With Pallet)	lb (kg)	200 (91)	
Wiring Box weight	lb (kg)	33 (15)	
Wiring Box shipping weight	lb (kg)	59 (27)	
Inverter dimensions (H x W x D)	in (mm)	28.1 x 26.5 x 10.5 (714 x 674 x 268)	

Table A-1 System specifications (Continued)

Wiring Box dimensions (H x W x D)	in (mm)	14.2 x 26.5 x 10.5 (361 x 674 x 268)
Inverter shipping dimensions (With Pallet) (H x W x D)	in (mm)	216.5 x 472.4 x 314.9 (5500 x 12000 x 8000)
Wiring Box shipping dimensions (H x W x D)	in (mm)	157.48 x 314.96 x 236.22 (4000 x 8000 x 6000)
Ambient air temperature for operation	°F (°C)	-13° to 140° (-25° to 60°)
Operating altitude	m (ft)	2000 (6560)
Relative humidity%	%	up to 100 condensing
Noise emission (at 1 m distance)	dBA	58
Features and Options		
Remote reset	Yes	
Storage temperature	-40° F to 140°F (-40° C to +60° C)	
User Interface	Graphic display, button	
Communication Interface	RS485 (MODBUS RTU), Ethernet / MODBUS TCP (Ethernet), USB and Dry Contact	
Monitoring	SunSpec Alliance profile, SPD and Arc Fault Detection (AFD) monitoring available with device	
Regulatory approvals		
Certifications	UL 1741, IEEE 1547- 2003, IEEE 1547.1- 2005, UL 1998- 2013, CSA C22.2 107.1-0, FCC Class A compliant	
Available product variants		
Base: AC connector and DC connector	PVSCL18NA100	PVSCL25NA100
Essential: Touch-safe fuse holder, DC switch and AC connector	PVSCL18NA200	PVSCL25NA200
Essential plus: Essential + AFD	PVSCL18NA201	PVSCL25NA201
Optimum: Essential + DC SPD and AC SPD	PVSCL18NA300	PVSCL25NA300
Optimum plus: Optimum + AFD	PVSCL18NA301	PVSCL25NA301

RCMU

The Conext CL transformerless inverters have an integrated electronic RCMU. This trips if the constant leakage exceeds 300 mA, or suddenly occurring residual currents of 30 mA. The integrated RCMU is sensitive to both AC and DC leakage currents.

Note: If an external RCD is used, it shall be a Type B RCD and trip current has to be at least 300 mA.

Maximum AC current during a voltage drop with LVRT function is limited to follow with the Conext CL:

- Conext CL 18000NA: 25 A
- Conext CL 25000NA: 33 A

Efficiency Curves

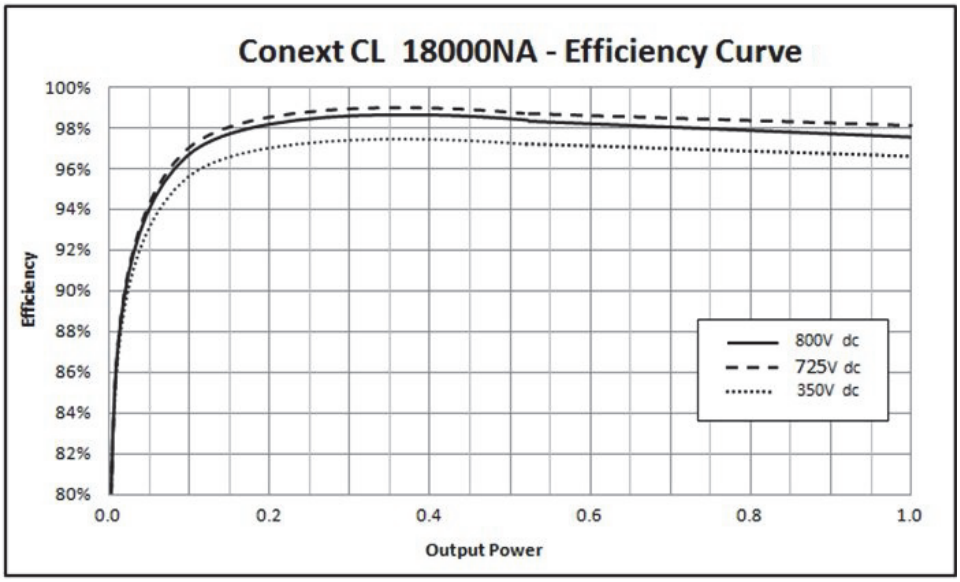

Figure A-1 Efficiency curve - 18KW

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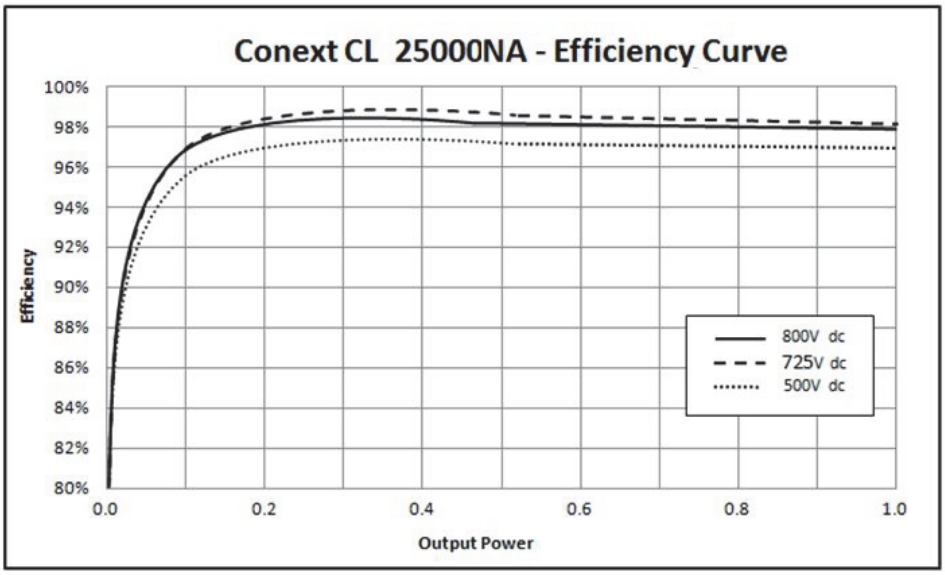

Figure A-2 Efficiency curve- 25KW

Derating Curves

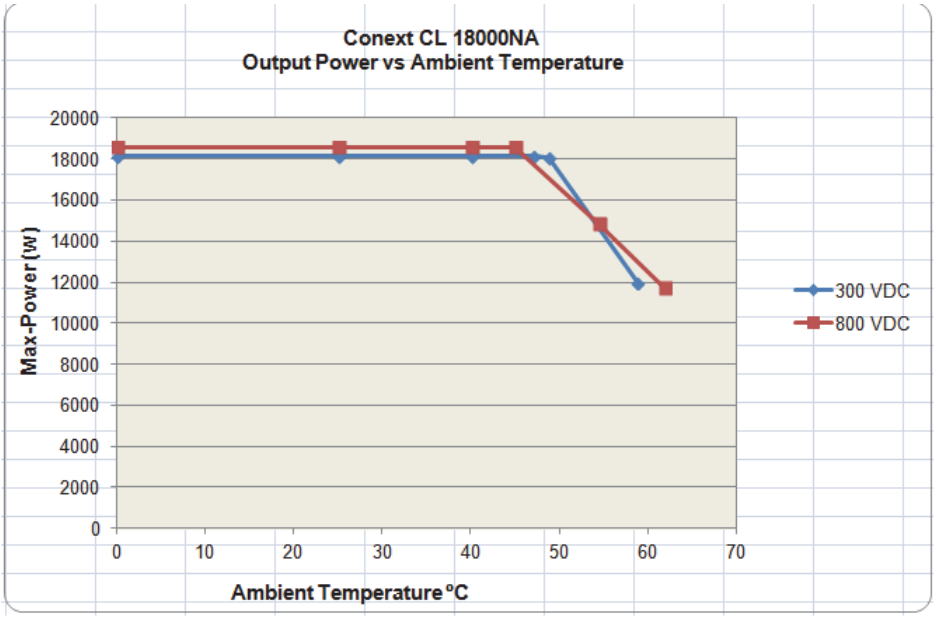

Figure A-3 Derating curve- 18KW

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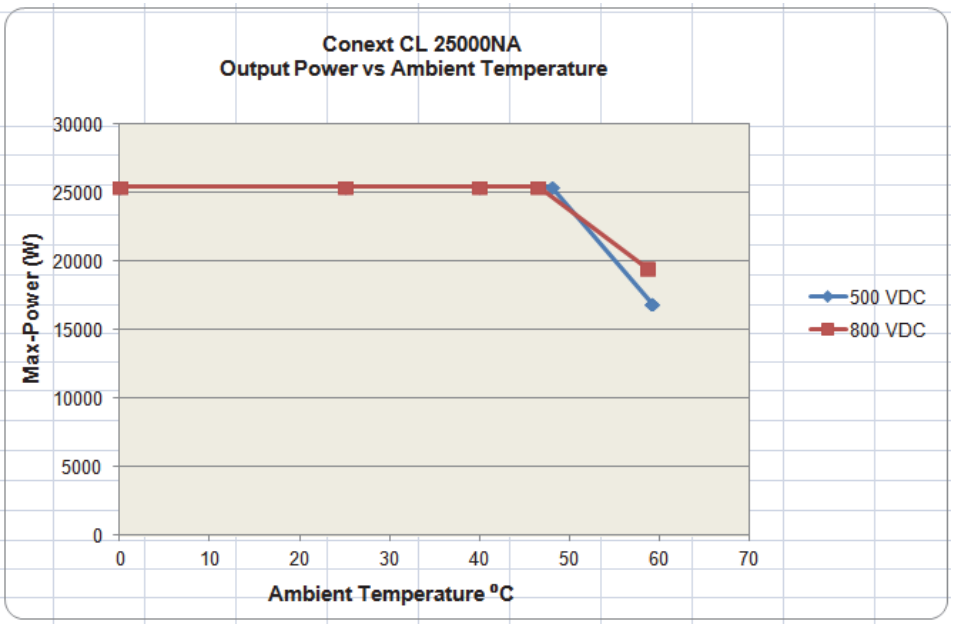

Figure A-4 Derating curve- 25KW

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B Descriptions of LCD Information

Appendix B describes the information that can be displayed on the LCD of the inverter.

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Description of Information Displayed on the LCD

Table B-1 describes text that is displayed on the LCD.

For a description of error messages, see Table 4-1 on page 4–2.

Table B-1 LCD texts

LCD text	Description
Home	Main screen on the LCD
Quick View	Displays the inverter status (online, offline and reconnecting), PV is Up/No PV, Fault (or) No Fault, and Today's Energy Production along with graph
Power Meter	Displays the DC input power and AC output power menus.
Energy Log	Displays the summary of energy of days, week, month and year.
Event Log	Displays the services, errors, warnings and events occurred inside the inverter
Inverter Info	Displays the inverter information such as serial number, FGA number, wiring box and firmware version.
Settings	Displays the General Settings, Comm Settings, Install Settings, and Power Control menus
Diagnostics	Displays the Fan Control & Fan Status
Status	Displays the Temperature, SPD Status, AFCI status menus
Password	Enter the password for authentication wherever it is applicable such as the Grid code/ Country selection, Install settings, Power control, Advanced temperature status and so on.
Power Meter	Home> Power Meter Displays the total DC input power screen and total AC output power screen
P (kW)	Power in kilo watts
V (v)	Voltage in volts
I(A)	Current in Ampere
PV1 - P (kW)	PV channel 1 DC input power
PV1- V(V)	PV channel 1 DC input voltage
PV1 - I(A)	PV channel 1 DC input current

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Table B-1 LCD texts (Continued)

LCD text	Description
PV2 - P (kW)	PV channel 2 DC input power
PV2 - V(V)	PV channel 2 DC input voltage
PV2 - I(A)	PV channel 2 DC input current
L1 - P (kW)	3 phase Phase A - AC output power
L1 - V (v)	3 phase Phase A - AC output voltage
L1- I(A)	3 phase Phase A - AC output current
L2 - P (kW)	3 phase Phase B - AC output power
L2 - V (v)	3 phase Phase B - AC output voltage
L2 - I (A)	3 phase Phase B - AC output current
L3 - P (kW)	3 phase Phase C - AC output power
L3 - V (v)	3 phase Phase C - AC output voltage
L3 - I(A)	3 phase Phase C - AC output current
Energy Log	Home> Energy Log Displays: • The Energy production information in kWH (kilo Watt Hour) for today and life time. • The inverter online time for today and life time in Hr (hours)
Today Energy	Total power or electricity generated today from the inverter
Today Runtime	Total operation time of the inverter with energy produced
Life Energy	Total electricity generated by unit
Life Runtime	Total operation time of the inverter
Today	Total energy generated today
Yesterday	Total energy generated yesterday
Month	Total energy generated present month
Last Month	Total energy generated last month
Year	Total energy generated present year
Last year	Total energy generated last year

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Table B-1 LCD texts (Continued)

LCD text	Description
7 Days	Energy generated in last seven days
Prev 7 Days	Energy generated in previous seven days
Event Log	Home> Event Log Displays the Active Services, Service Logs, Event Logs and All Logs (All up to 10 entries)
Active Services	Displays the active errors and services in the inverter.
All Logs	Displays all the errors, services, warnings and events and displays up to 10 logs
Service Log	Displays the set and clear of all errors, services warnings and events.
Event Log	Displays all the events
Service Details	Displays the detailed description of a service along with date and time
Event Details	Displays the detailed description of an event along with date and time
Log Details	Displays the detailed description of Log along with the date and time on the inverter
Inverter Info	Home> Inverter Info Displays the inverter information such as inverter details, wiring box details and firmware version
Inv.S.No.	Inverter serial number
Inv.FGA	Inverter FGA number
W.box.FGA	Wiring box FGA number
W.box.S.No. (optional)	Wiring box serial number
CAP Ver	Communication application firmware version number
CBT Ver	Communication bootloader firmware version number
AC DSP Ver	AC processor application firmware version number
DC DSP Ver	DC processor application firmware version number
General Settings	Home> Settings> General Settings Displays the settings of name, language, date and time, contrast, back light and backlight time out

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Table B-1 LCD texts (Continued)

LCD text	Description
Name	Name given by user/ installer for the inverter identification
Language	View/ set language for display
Date & Time	View/ set date, time zone and time
Contrast	View/ set LCD contrast (range 43- 65)
Backlight	View/ set LCD Backlight brightness (range 0-10)
Backlight timeout(s)	View/set LCD backlight ON timeout in seconds (range 0-999)
Network settings	Home> Settings> Comm Settings> Network Settings Network related settings like IP-Address, Net mask, Gateway and DHCP
IP Address	View/ set inverter IP address
Gateway	View/ set inverter network gateway
Netmask	View/ set inverter network mask
DHCP	View/ set DHCP Enable(1)/ Disable(0)
Modbus settings	Home> Settings> Comm Settings> Modbus Settings Configure the Modbus parameters
Baud rate	View/ set the inverter to operate at different Modbus Baud rates
Modbus Address	View/ set Modbus address or slave ID, default set to 10
TCP port	View/ set TCP port for communication, Default 502
Install settings	Install settings are settings related to PV insulation, DC - injection, RCMU enable, reset factory and Multifunction relay
Select Country	Lets you to select country / grid setting, displays the selected settings and lets you to change the settings, with in predefined grid code
Grid setting	Displays the grid related parameters and predefined values of the selected grid
PV Insulation	Displays the PV insulation menu
Enable	PV insulation check enable(1)/ disable(0)

Table B-1 LCD texts (Continued)

LCD text	Description
Resistance (KO)	PV insulation resistance value threshold in Kilo Ohms
RCMU Enable	RCMU enable (1)/ disable (0)
Factory Default	Restores all the default values
Revert To FPU	Select this option and restart the inverter to reset to the first time power up configuration settings
Wiring Box selection	Displays the different wiring box options to configure as per part number
Multi function relay	Displays the Multiple Relay settings with respect to either of temperature, power, external load and fault limits
MPPT Settings	View/ set MPPT configuration (single/ dual)
Custom	Customise the existing grid settings or new grid code settings
Power control	Home> Settings> Power Control To control the Active and Reactive power
Active power	Home> Settings> Power Control> Active Power To control the Active power or real power (KW)
Power limit	Home> Settings> Power Control> Active Power> Power limit Limits the inverter power in terms of percentage or KW level
PCT Enabled	View/ set the power control (enable/ disable)
Set Point (%)	Displays the Power control in percentage with respect to the rated power
Set Point (KW)	Displays the Power control in kw (Kilo watt) with respect to the rated power
Temperature	Home > Status> Temperature> Advanced Displays the temperature values of different modules in the inverter.
DC Module 1	Displays the Boost Module 1 temperature
DC Module 2	Displays the Boost Module 2 temperature
Ambient Temp	Displays the external Ambient temperature of the inverter

Table B-1 LCD texts (Continued)

LCD text	Description
AC Module A	Displays the internal Module A heatsink temperature of the inverter
AC Module B	Displays the internal Module B heatsink temperature of the inverter
AC Module C	Displays the internal Module C heatsink temperature of the inverter
SPD Status	Home > Status> SPD Status Displays the SPD status (based on the wiring box selection)
SPD AC	Displays the AC side SPD (Surge protection Devices) monitoring status
SPD PV1	Displays the PV1 or DC1 side SPD monitoring status
SPD PV2	Displays the PV2 or DC2 side SPD monitoring status
AFCI Status	Home > Status> AFCI Status Displays the AFCI (depends on the wiring box selection)
Arc Fault	Displays the status of Arc fault detected by the AFD module
Diagnostics	Home> Diagnostics Displays the Diagnostics menu
Fan Test	Home > Diagnostics> Fan Control> Fan Test
Fan Status	Displays the status of the Fan operation
Fan Control	To switch on/ off the inverter fan
Switch Off	Turns off the Fan. (All the three fans turn Off)
On Test	Turns On the Fan. (All the three fans turn On)
Automatic	To set the fan in automatic control, unit temperature dependant. (All three fans in automatic control)

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Information About Your System

As soon as you open your Conext CL series photovoltaic grid tie inverter package, record the following information and be sure to keep your proof of purchase.

- Serial Number • _____
- Part Number • _____
- Purchased From • _____
- Purchase Date • _____

Index

A

AC
  cable, maximum length 2–40
  cable, preparing and connecting 2–36 connector (specifications) A–3
  grid connection 2–36, 2–37
air outlets
  location 1–6

C

caution
  risk of equipment damage 2–8, 2–9, 2–32, 2–33, 2–36, 2–39, 2–44, 3–6
cleaning
  fans 5–4
clearance required 2–8
communication module
  cables, connecting 2–43
conductor sizing, recommended
  AC 2–36
  DC 2–31
contents of the package 2–3, 2–4
control panel 3–3

D

danger
  hazard of electric shock 2–31, 5–2
  maximum operating current A–2
  specifications A–2
DC wiring polarity 2–35
direct sunlight 2–8

E

earthing terminal 2–40
electrical specifications 2–33
environmental specifications 2–51
error codes 4–2
error messages 4–2
ESC button 3–4

F

fans, cleaning 5–4
firmware version 3–11
fuse A–3

G

grid
  AC connection 2–36, 2–37

H

hazard of electric shock 2–31, 2–41, 2–42, 5–2
hazard of electric shock, fire, and equipment damage 2–32
hazard of fire 2–7
hazard of shock 2–47

I

“Information about Your System” form D–1
installation
  overview 2–5
  PV planning 2–32
  See also mounting
inverter
  earthing terminal 2–40
  installation 2–5
  serial number D–1
  turning on/off 3–2
Inverter Information screen 3–11
IP address 2–50

L

LCD
  messages displayed 4–2
location of installation 2–6

M

main menu
maintenance, periodic 5–2
maximum operating current, DC A–2
messages (LCD) 4–2
mounting
  correct position 2–9
  incorrect positions 2–10
  See also mounting plate
mounting plate
  fastening to wall 2–17
multiple inverters
  RS485 wiring 2–46

O

OK button 3–4
operating current, maximum, DC A–2
operation 3–1
Output P B–4
Output P maximum B–4

P

package contents 2–3, 2–4
packing list 2–3, 2–4
periodic maintenance 5–2
planning of installation 2–6
protection
  degree A–4
protective devices, recommended
  AC 2–36
  DC 2–31
purchase date D–1

R

regular maintenance 5–2
relative humidity A–4
requirements
  environmental 2–7
risk of equipment damage 2–8, 2–9, 2–32, 2–33, 2–36, 2–39, 2–44, 2–47, 3–6
RS485 connection
  overview 2–43
  data format 2–44

S

semi-annual maintenance 5–4
sizing tool, PV 2–32
specifications
  DC input A–2
  electrical 2–33
  environmental 2–51
  system A–2
spray, caution 2–8
sprinklers, caution 2–8
sunlight, direct 2–8
system specifications A–2

T

turning inverter on/off 3–2

U

Unpacking 2–4
unpacking 2–12
Up button 3–4, A–2

V

ventilation 2–8

W

wall, fastening mounting plate to 2–17
warning
  hazard of electric shock 2–41, 2–42
  hazard of electric shock, fire, and equipment damage 2–32
  hazard of fire 2–7
  hazard of shock 2–47
  risk of equipment damage 2–47
wiring
  AC 2–36, 2–37
wiring polarity, DC 2–35

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